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THE MEDICAL JOURNAL OF AUSTRALIA

VOL. II.—30TH YEAR. SYDNEY, SATURDAY, OCTOBER 23, 1943. No. 17.

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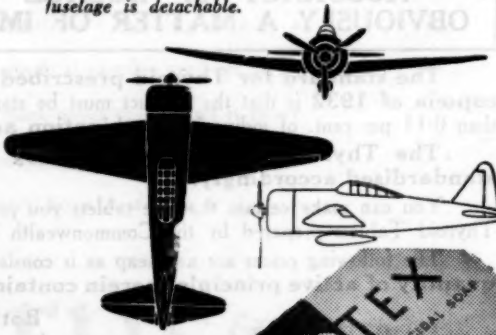

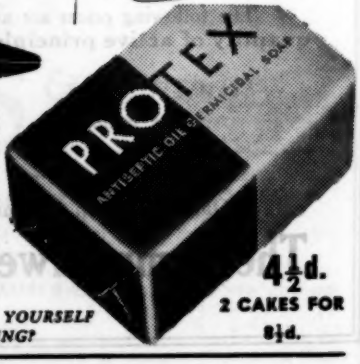

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THE HÆMOGLOBIN LEVEL IN BLOOD DONORS.

By LUCY M. BRYCE AND RACHEL JAKOBOWICZ.

From the Walter and Eliza Hall Institute of Research in Pathology and Medicine and the Red Cross Blood Transfusion Service (Victorian Division).

PRIOR to the outbreak of war, a roster of some 400 voluntary donors was found sufficient to maintain the civilian blood transfusion service of the Victorian Division of the Australian Red Cross Society. Approximately 85% of these donors were young men, and although hæmoglobin estimations were made as part of the routine preliminary examination of volunteers, rejection because of anæmia rarely occurred.

For war purposes, however, many thousands of donors have been enrolled. The majority of these being women, we realized that a certain proportion of them, even if otherwise in apparently good health, might present some degree of anæmia, which would almost certainly be accentuated at least temporarily, and possibly permanently, by the giving of blood. We therefore decided not to accept volunteers whose hæmoglobin level was less than 85% (equivalent to 11·9 grammes per 100 cubic centimetres on the scale used), and to reexamine all donors after their second and subsequent donations in respect of the hæmoglobin content of their blood.

The figures presented in this paper are based on 18,600 estimations of hæmoglobin value during the period of twenty-five calendar months from June 1, 1940, to June 30, 1942. All estimations have been made on a single hæmoglobinometer of the Sahli type, in which the acidified blood is matched against a tinted glass colour standard. Prior to use, the instrument and its accompanying pipettes and graduated tubes were standardized by comparison of the readings obtained with those given by the oxygen capacity method. Owing to the time factor involved in the conversion of hæmoglobin to acid hæmatin, it was found necessary to allow the acidified blood sample to stand for at least two hours at room temperature to ensure constancy of readings. With this technique, it was found that 100% on our instrument was equivalent to 14 grammes *per centum* of hæmoglobin. The colour standard has again been checked since these figures were obtained and has shown no alteration.

The estimations were made on venous blood, 0·5 cubic centimetre of which was placed in tubes of a diameter of five-eighths of an inch, in which 0·25 cubic centimetre of a mixture of 16·0 grammes of potassium oxalate and 24·0 grammes of ammonium oxalate per litre was previously evaporated to dryness.

Preliminary experiments showed that there was no appreciable difference between readings obtained with blood acidified a few minutes after withdrawal and that which had been oxalated for some eighteen to twenty hours (overnight). As the majority of the blood samples from our volunteers for the preliminary tests (blood group, serum titre, Kahn test, hæmoglobin value *et cetera*) are taken in the late afternoon or early evening, the hæmoglobin estimations recorded in this paper have almost all been performed on samples oxalated overnight.

A tourniquet was used in almost all cases, but as the routine procedure is to apply it only immediately before insertion of the needle, it is unlikely that any gross variations which might be brought about by congestion have occurred. Persons whose veins could not be rendered prominent enough for easy venipuncture by this amount of constriction were rejected without further examination and are therefore not included in this series.

We consider it important to use tubes of relatively wide calibre in proportion to the amount of blood introduced to facilitate both immediate mixing with the dried oxalate and the subsequent taking of samples for hæmoglobin estimation. Before the sample is taken, the blood cells must be thoroughly mixed with the plasma. This should be done by gentle rotation or repeated inversion. Vigorous shaking must be avoided, as it produces air bubbles which interfere with the accuracy of the sample taking.

The results obtained are shown in Table I. The figures for volunteers prior to the giving of blood provide an indication of the hæmoglobin level in an average cross-section of the adult (eighteen to sixty-five years) community of Melbourne, as represented by persons whose health was at least sufficiently good to allow them to follow their usual occupations and to incline them to volunteer as blood donors. As has been indicated earlier, there was no conscious selection by us, the only persons rejected prior to estimation of hæmoglobin value being the small number (approximately 0·5% of all volunteers) whose veins were considered quite unsuitable, and those of very small or poor physique.

Table I.

Hæmoglobin Levels in Donors Before and After giving Blood.

Subjects.	Hæmoglobin Level.	Before Giving Blood.	At the End of the Second Donation.	At the End of the Third Donation.	At the End of the Fourth Donation.	At the End of the Fifth to the Twenty-sixth Donations.
Men.	71%–80%	3 (0·07%)				
	81%–84%	5 (0·12%)				
	85%–90%	45 (1·09%)	6 (0·77%)	8 (1·89%)	1 (0·52%)	3 (1·62%)
	91%–100%	506 (12·31%)	147 (18·81%)	75 (17·73%)	38 (19·90%)	25 (13·25%)
	101%–110%	1,660 (40·39%)	330 (42·25%)	210 (49·64%)	88 (46·07%)	94 (41·67%)
	111%–120%	1,547 (37·64%)	260 (33·29%)	118 (27·92%)	56 (29·32%)	52 (29·29%)
	121%–130%	343 (8·34%)	38 (4·87%)	12 (2·83%)	8 (4·18%)	8 (4·33%)
	>130%	2 (0·05%)				
Total number examined		4,110	781	423	191	182
Average hæmoglobin *per centum*		110·24	109·10	108·0	108·46	108·64
Average hæmoglobin value per 100 cubic centimetres		15·43 grammes	15·27 grammes	15·12 grammes	15·18 grammes	15·21 grammes
Number with hæmoglobin value less than 85%		8 (0·19%)	—	—	—	—
Women.	<61%	7 (0·08%)	2 (0·10%)	2 (0·17%)		2 (0·60%)
	61%–70%	28 (0·32%)	6 (0·32%)	5 (0·43%)	8 (1·34%)	3 (0·91%)
	71%–80%	177 (1·98%)	43 (2·29%)	56 (4·86%)	26 (4·36%)	24 (7·30%)
	81%–84%	159 (1·77%)	26 (1·38%)	22 (1·91%)	17 (2·85%)	3 (0·91%)
	85%–90%	1,189 (13·27%)	379 (20·16%)	247 (21·42%)	121 (20·30%)	76 (23·17%)
	91%–100%	3,626 (40·49%)	875 (46·54%)	549 (47·61%)	281 (47·14%)	144 (43·90%)
	101%–110%	3,010 (33·62%)	479 (25·47%)	239 (20·73%)	134 (22·48%)	71 (21·65%)
	111%–120%	733 (8·17%)	69 (3·67%)	33 (2·86%)	9 (1·51%)	5 (1·52%)
	120%	27 (0·30%)	1 (0·05%)			
Total number examined		8,956	1,880	1,153	596	328
Average hæmoglobin *per centum*		99·47	96·88	95·60	95·44	94·65
Average hæmoglobin value per 100 cubic centimetres		13·93 grammes	13·56 grammes	13·39 grammes	13·36 grammes	13·25 grammes
Number with hæmoglobin value less than 85%		371 (4·14%)	77 (4·09%)	85 (7·37%)	51 (8·55%)	32 (9·75%)

It is interesting to note, therefore, that our figures show a logical degree of relationship to those obtained by Wardlaw in Sydney in 1941.[1] In a small group of healthy young adults, deliberately selected with a view to the obtaining of normal standards, he found that the average hæmoglobin value for males was 15·7 grammes per 100 cubic centimetres, and for females 13·3 grammes. The slightly lower figure (15·4 grammes) for males in our series is what might be expected in a reasonably healthy but unselected group of larger age range. For females, our average figure (13·9 grammes) is slightly higher than Wardlaw's; but this is also to be expected by reason of the inclusion in our series of women in the post-menopausal years, in which the hæmoglobin level tends to rise, owing to cessation of the demands of the reproductive functions on the hæmatopoietic system.

It may therefore be stated that in Australian urban populations, such as those of Melbourne and Sydney, a hæmoglobin level of 15·4 to 15·7 grammes per 100 cubic centimetres for males and 13·3 to 13·9 grammes for females should be regarded as the average normal figure. As on many of the hæmoglobinometers in use in this country (including the one used by us) 100% is equivalent only to 14 grammes per 100 cubic centimetres, it should be emphasized that this figure, in spite of its conventional implication of perfect normality, may actually indicate a slight degree of anæmia in a male, and conversely, that a figure of 115% to 120% does not necessarily indicate hæmoconcentration (for example, in young soldiers suffering from wound shock). The practice of recording hæmoglobin levels in terms of percentage is therefore justified only if the equivalent in grammes per 100 cubic centimetres is also known and recorded.

Age.

The variations in hæmoglobin level in different age groups have been analysed in an unselected proportion of our series, and are shown in Table II. Williamson[2] found very little variation in age groups which are comparable to those in our series. We found the lowest figures in the lowest age groups. The variation is, however, insignificant in males. In females, there is a more appreciable rise in hæmoglobin level in the higher age groups. As has been indicated above, we attribute this mainly to the altered physiological demands of the post-menopausal years. In both sexes, however, in the case of blood donors, there may be a factor of unconscious selection by the volunteers themselves, as those among older people who are feeling the effects of minor degrees of ill-health or loss of vigour, with which some anæmia may be associated, are probably less likely to volunteer as donors.

Seasons.

Various workers have reported on seasonal variation in hæmoglobin level, but with conflicting results. Bratt[3] found that in 93% of 63 persons, the hæmoglobin level was lower in winter by 2% to 11%. Lippincott,[4] on the other hand, found higher values in winter than in summer, and Chamberlain[5] found no seasonal variation.

Our figures for the twenty-four months (July, 1940, to June, 1942, inclusive) show that in females the average was highest (100·4%) in the summer-autumn quarter (January, February, March) and lowest (98·6%) in spring (September, October, November). This variation is insufficient to be significant, and in any case it is not so great as that observed in some instances between the corresponding month in each year. In males the lowest average was 109·2% (spring) and the highest 111·3% (summer-autumn).

We cannot therefore demonstrate any significant seasonal variations.

Occupation.

Owing to the frequent changes of occupation incidental to war work, we have not attempted to assess the effect, if any, of occupation on hæmoglobin level.

Effect of Blood Donations.

In dealing with voluntary donors, it is not easy to obtain data on the effect of blood donations on hæmoglobin level, as it is usually impracticable to recall the donors for the making of hæmoglobin estimations at frequent intervals after they have given blood. We have therefore resorted to the examination of the hæmoglobin level in samples of blood taken from that remaining in the tubing after withdrawal of the "taking" needle from the donor's arm. Observations on a number of donors have shown that the hæmoglobin value in such samples is identical with that of a pre-transfusion sample. The hæmoglobin level in the sample collected at the end of the third donation is regarded as representative of that maintained or regained since the second donation, and so on. The minimum interval between donations is three months, but longer intervals often occur.

The results have not been influenced by iron therapy (unless given without our knowledge). As has been mentioned above, no volunteer was accepted whose hæmoglobin level was below 85%. Since June, 1941, we have also debarred from further donations those whose hæmoglobin had fallen to this level after they had given blood. Subjects in this latter group were informed of the presence of "slight anæmia", and advised either

TABLE II.

Hæmoglobin Level at Different Ages in 3,418 Donors (Before giving Blood).

Hæmoglobin Level.	815 Men. Age in Years.				2,603 Women. Age in Years.			
	18–30	31–40	41–50	51–65	18–30	31–40	41–50	51–65
61%	—	—	—	—	1 (0·1%)	—	1 (0·2%)	2 (0·7%)
61%–70%	1 (0·3%)	—	—	—	2 (0·2%)	4 (0·5%)	3 (0·5%)	1 (0·4%)
71%–80%	—	—	1 (0·6%)	—	25 (2·4%)	17 (2·3%)	16 (2·8%)	2 (0·7%)
81%–90%	6 (1·8%)	4 (1·6%)	4 (2·5%)	3 (3·2%)	211 (20·7%)	135 (18·3%)	84 (14·8%)	24 (8·5%)
91%–100%	53 (16·0%)	35 (13·7%)	22 (13·6%)	12 (12·6%)	432 (42·5%)	299 (40·5%)	210 (37·1%)	110 (39·1%)
101%–110%	152 (45·8%)	107 (41·8%)	68 (42·0%)	37 (38·9%)	289 (28·4%)	217 (29·3%)	204 (36·0%)	98 (34·9%)
111%–120%	99 (29·8%)	95 (37·1%)	56 (34·6%)	32 (33·7%)	56 (5·5%)	63 (8·5%)	47 (8·3%)	43 (15·3%)
120%	21 (6·3%)	15 (5·9%)	11 (6·8%)	11 (11·6%)	1 (0·1%)	4 (0·5%)	1 (0·2%)	1 (0·4%)
Total number of donors ..	332	256	162	95	1,017	739	566	281
Average hæmoglobin *per centum*	108·6	109·6	109·5	109·7	96·5	98·4	99·2	101·2
Average hæmoglobin value per 100 cubic centimetres ..	15·20 grammes	15·34 grammes	15·33 grammes	15·36 grammes	13·51 grammes	13·78 grammes	13·89 grammes	14·2 grammes

to consult their own doctor, if they had one, or failing this, to take iron under our direction. A few of these subjects, about whom we have data, will be discussed later.

Statistical Analysis.

The figures obtained for donors who have given two or more donations are shown in Table I. For the purpose of analysis, an arbitrary division has been made between the "anæmic" and the "non-anæmic", a hæmoglobin level of less than 85% being regarded as indicative of "anæmia". Each group in respect of number of blood donations has been considered as a separate sample of the community. Some subjects are included in successive groups, but others had had their preliminary tests or had already given blood two or more times prior to the two-year period under consideration. We do not consider that this inclusion of some subjects in more than one group invalidates the statistical analysis. The exclusion of those who are transferred from the "non-anæmic" to the "anæmic" group after two or more donations may slightly reduce the apparent incidence of "anæmia" in the later groups. Their numbers are, however, very small in comparison with the total included in the groups, and the effect of their exclusion may be counterbalanced by the probability that the factors which produce anæmia in a certain proportion of women irrespective of blood donation may also continue to operate in those who act as donors.

The figures given in Table I show that in men there is no significant difference in the hæmoglobin level before and after the giving of blood under the conditions prescribed by the Red Cross Blood Transfusion Service. In women, there is an incidence of "anæmia" (hæmoglobin value of less than 85%) in 4·14% of volunteers prior to the giving of blood, and a slight but definitely increased percentage (9·75%) at the end of five or more donations; this progresses in direct relation to the number of donations given. Application of the χ^2 test gives a value for P of considerably less than 0·01, which indicates that the increase is of statistical significance.

This difference in the effect of blood donations on men and on women is almost certainly associated with the greater physiological demands made on the hæmatopoietic system of women. As, however, the proportion of all female donors who develop anæmia is actually quite small, it is pertinent to discuss other factors which are possibly either contributory or compensatory. Such factors are set out hereunder.

Periodic Loss of Hæmoglobin Due to Menstruation. Widdowson and McCance,[6] on the basis of several earlier investigations, assess the periodic loss of hæmoglobin due to menstruation as being on an average in the region of 35 milligrammes of iron per menstrual period. Barer and Fowler,[7] in an investigation of 100 women regarded as being in normal health, found the periodic iron loss to range from 2·28 to 78·96 milligrammes.

Replacement of Hæmoglobin Lost in Menstruation. Hæmoglobin lost in menstruation is normally replaced by means of the iron in the food, together with the utilization of previously stored iron. Widdowson and McCance[6] found that among 63 women in England whose iron intake they investigated, the daily average was 11·4 milligrammes, with a range from 5·5 to 17·3 milligrammes of "total" iron. They state that ingested iron is, however, "available" only when in inorganic form. Iron in this form constitutes a varying proportion of the total iron content of different foods, being relatively greater in plant foods, eggs and milk than in meat. Among the 63 women investigated by Widdowson and McCance, the average maximum and minimum "total" intakes represented respectively 7·9, 5·0 and 12·4 milligrammes of "available" iron.

A survey in Scotland in 1933 by Davidson and others[8] revealed an average intake of 11 milligrammes of total iron among persons with low incomes; 46% of the women in this series had a hæmoglobin level of less than 85% on the Haldane scale. These authors consider that a daily intake of 15 milligrammes is probably necessary to meet the physiological demands of most women.

Even if the estimated iron intake appears adequate, not all the ingested iron is absorbed from the gastro-intestinal tract. Fowler and Barer[10] state that an average of 32·6% of the total iron given by mouth is retained, and Whipple and Robscheit-Robbins[9] estimated that dogs rendered anæmic by experimental means similarly utilized about 35% of ingested iron. Barer and Fowler also provide evidence[12] that in humans, achlorhydria decreases the retention of ingested iron.

It is obvious, therefore, that the amount of iron obtained from the food for hæmoglobin formation is dependent on at least two variable factors—the intake of "available" iron and the proportion of the latter which is absorbed and utilized.

No detailed surveys of iron metabolism comparable to those quoted above are available for Australia; but it is unlikely that economic factors influence iron intake here to the extent to which they do in some other countries. Ignorance of food values is probably of more importance, and voluntary restriction of diet may play a part. As far as our blood donors are concerned, however, we have no data on these aspects of iron intake or on variability of absorption.

The amount of iron necessary to make up for the periodic menstrual loss varies, of course, with the latter. With the average figures given by Widdowson and McCance of a loss of 35 milligrammes per menstrual period and a daily intake of 7·9 milligrammes of "available" iron, they calculate that four and a half days' intake would be sufficient to replace the amount lost. This assumes that all "available" iron is utilized.

On the other hand, Leverton and Roberts[11] showed that apparently healthy women might be in "negative" iron balance—that is, losing more iron in fæces, urine and menstrual fluid than they were ingesting in diets containing a daily average of 10 to 13·6 milligrammes of total iron. Barer and Fowler[7] also pointed out that to replace a menstrual loss of 77·96 milligrammes (the highest in their series) would require a daily storage of 3·29 milligrammes, which, according to their estimate, is greater than the amount which could be absorbed daily from an average diet.

If, therefore, unfavourable aspects of the above factors such as greater than average menstrual loss, less than average iron intake, and perhaps defective absorption, are by chance all operative in one subject, it is probable that at best she will be in

a precarious state of iron balance, and that even if this is usually just maintained on the "positive" side, the extra demands of a blood donation may convert it into a "negative" balance, from which recovery may be difficult unless aided by iron therapy. As regards the actual loss caused by blood donations, we may consider as a hypothetical case a person with a hæmoglobin content of 14 grammes per 100 cubic centimetres, and a blood volume of 5,000 cubic centimetres. The total hæmoglobin content of such a person's blood will be 700 grammes, which is equivalent to 2,300 milligrammes of iron. A donation of 500 cubic centimetres of blood will entail a loss of 230 milligrammes of iron. A daily intake of 7·9 milligrammes of "available" iron will provide 230 milligrammes in twenty-nine days. Even if it is assumed that all "available" iron is absorbed and utilized, it would seem, therefore, that a person whose iron balance is only just "positive" must use at least twenty-nine days' intake to replace the amount lost by a donation of 500 cubic centimetres of blood, and an additional four and a half days' intake to make up an average menstrual loss. In such a person, who presumably has little or no reserve iron, some degree of anæmia would seem inevitable until a "positive" balance was again maintained, which would probably be in six to eight weeks on an average diet.

Restoration of Hæmoglobin Value.

It is not possible to state exactly how long a period has been required for restoration of the original hæmoglobin level in the majority of our women donors; but the fact that in approximately 90% of them the average hæmoglobin level after five or more donations was similar to that of volunteers prior to giving blood indicates that regeneration takes place within the three-monthly period at which examinations are usually made. Examples of maintenance of the original level after a series of donations are shown in Table III. We have also more precise data concerning a few subjects in whom complete or partial restoration has taken place in a shorter time than that postulated above from theoretical considerations. Such subjects presumably have adequate reserve stores of iron, which they can utilize efficiently. The details of four such cases are shown in Table IV. It will be seen that in one person restoration of the hæmoglobin level to that at the time of the donation was effected in three days, in another in five days, while in the other two the time taken approximated to the calculated period.

Effect of Iron Therapy.

The majority of the donors whom we advised to take iron have not yet reported to us for subsequent retests; but the

TABLE III.

Hæmoglobin Levels in Individual Donors after Successive Donations.

Donor.	Age. (Yrs.)	Hæmoglobin Percentage. Before Giving Blood.	Date, Amount (Cubic Centimetres) and Hæmoglobin Percentage at End of the Following Donations.											
			Second.			Third.			Fourth.			Fifth.		
			Date.	Amount.	Hæmoglobin Percentage.	Date.	Amount.	Hæmoglobin Percentage.	Date.	Amount.	Hæmoglobin Percentage.	Date.	Amount.	Hæmoglobin Percentage.
Mrs. Br. ..	42	94	24.6.41	570	91	14.11.41	570	90	23.6.42	570	90			
Miss Ba. ..	47	104	9.7.41	570	100	18.11.41	600	96	27.3.42	570	100	21.7.42	460	96
Miss La. ..	38	91	28.4.41	600	91	30.1.42	600	86	26.5.42	600	88	17.9.42	600	92
Mr. Le. ..		110	26.8.41		115	10.12.41		111	18.3.42		110	27.7.42		112
Mr. Pe. ..	48	111	28.5.41	570	115	29.9.41	570	108	11.12.41	460	112	31.3.42	480	112
Miss McC. ..	39	99	14.11.41	570	100	20.2.42	600	100	29.5.42	600	102	28.8.42	600	96
Mr. K. ..	48	108	27.6.41	570	112	29.10.41	570	110	5.3.42	570	110			
Miss Ca. ..	36	89	18.6.41	570	90	12.11.41	570	89	5.5.42	600	85	11.9.42	540	86
Mr. Co. ..	60	111	18.6.41	570	111	7.11.41	570	110	6.5.42	600	115	27.8.42	520	112
Miss Wa. ..	41	88	3.12.41	600	90	4.6.42	380	90	11.9.42	600	80			

Donor.	Age. (Yrs.)	Sixth and Seventh.			Eighth and Ninth.			Tenth and Eleventh.		
Miss Ja. ..	34	27.5.41	570	110	25.11.41	600	108	11.6.42	600	110
		27.8.41	570	106	24.2.42	600	110	16.10.42	600	111

Mr. Ch. ..		Hæmoglobin percentage at end of 15th donation:	106
Mr. F.-M. ..		Hæmoglobin percentage at end of 18th donation:	113
Mr. Ha. ..		Hæmoglobin percentage at end of 23rd donation:	105
Miss Ha. ..	47	88 Hæmoglobin percentage at end of 26th donation:	91

TABLE IV.

Rate of Regeneration after Blood Donation.

Times of Testing of Hæmoglobin Levels.	Mrs. H. (aged 45 years). Fifth Donation (600 Cubic Centimetres).	Miss P. (aged 22 years). Third Donation (460 Cubic Centimetres).	Miss B. (aged 27 years). Ninth Donation (570 Cubic Centimetres).	Miss S. (aged 41 years). Third Donation (400 Cubic Centimetres).
Time of enrolment		91%		
Beginning of donation	104%		a.m. 88%	a.m. 104%
End of donation	102%	100%	89%	a.m. 88%
1st day after donation	a.m. 100%			
	p.m. 91%		p.m. 80%	
2nd day after donation	a.m. 90%		a.m. 81%	
	p.m. 94%			
3rd day after donation	a.m. 99%	99%		
4th day after donation	a.m. 100%		a.m. 85%	
5th day after donation	103%		a.m. 80%	
7th day after donation			a.m. 77%	97%
9th day after donation				
12th day after donation			a.m. 77%	
15th day after donation			a.m. 77%	
21st day after donation			a.m. 82%	
23rd day after donation			77%[1]	
26th day after donation			82%	99%
28th day after donation				
34th day after donation			89%	

[1] Second day of menstrual period.

results of administration of iron to those whom we have re-examined to date are shown in Table V. From this table it will be seen that in all the cases so far examined iron therapy has considerably raised the hæmoglobin level. We recognize, of course, that in a larger series, as in any sample of the community, cases of anæmia due to causes not amenable to iron therapy might be encountered and would call for more complete medical and hæmatological examination. We allow those whose hæmoglobin value reaches a satisfactory level after iron therapy to give further donations if they express a wish to do so, with a warning that further iron may be necessary. Two such cases (III and VI) are shown in Table V; in one of them (Case III) the hæmoglobin level regained after iron therapy has been maintained after three subsequent donations of blood without further administration of iron. In the other case (VI) the maximum level reached (106%) has not been maintained, but equilibrium appears to have been established at the still satisfactory figure of 96%.

Case IV is worthy of comment.

This woman made a special trip from a country town some sixty miles from Melbourne for the express purpose of giving her blood "for serum for the soldiers". Her dismay at the idea of not being allowed to do so there and then after having come so far was so great that we departed from our rule and carried out the "preliminary" tests on a blood sample taken at the time of her first donation. Somewhat to our dismay in turn, her hæmoglobin value at this time was 66%, with a probable subsequent fall of some 10%. On being told by letter that she was anæmic, she expressed great disappointment at not being allowed to act as a donor again, and insisted that she had felt "marvellous" after her first donation. On our advice she assiduously took iron three times a day in the form of a mixture, prescribed by her local pharmacist, which contained "Colferrol" half a drachm and *Syrupus Glycerophosphatum Compositus* half a drachm, with the slow but ultimately excellent results shown. She is full of gratitude to the transfusion service for her present feeling of well-being and for permission to reenrol as a blood donor.

Discussion.

This investigation was prompted by a realization that the enrolment for war purposes of large numbers of donors gave opportunity for a survey on a scale which would be far less practicable in peace time. We also wished to know whether acting repeatedly as donors would, by rendering them anæmic, be detrimental to the health of volunteers, particularly women, whose relatives are often fearful of the consequences.

It will be noted that the amount of blood taken from our donors has usually been between 500 and 600 cubic centimetres. This is a larger amount than is taken as a rule from civilian donors in Britain and America, in both of which countries the usual practice is to take 300 to 400 cubic centimetres. Even with the larger amounts, however, we consider it reassuring that only in such a small percentage of donors did deterioration in the hæmoglobin level occur. Moreover, it is difficult to determine just what hæmoglobin level is necessary for good health. Widdowson and McCance[6] state that "there is no proof that a hæmoglobin level of 103% is better for a woman than a level of 93%", although the latter figure, which is their accepted "normal", can be raised by about 10% by the administration of iron, and therefore "may not be a true normal but should perhaps be regarded as mildly pathological". They consider that the whole question can be settled only by a large amount of experimental work on normal women. We ourselves know of several women who lead strenuous lives with a hæmoglobin content consistently (over a period of years) lower than our average by 10% to 20% which cannot be attributed to defective diet or any obvious disease process likely to cause mild anæmia. Possibly in such persons the iron metabolism is adjusted so that a lower level is compatible with the needs. Nevertheless, in such cases there is less margin of safety between the usual hæmoglobin level and that which may result in symptoms directly referable to anæmia, or which may, as was demonstrated in the case of infants by Helen Mackay,[13] be associated with lessened resistance to infections. For these reasons, it is unwise to call on such persons to act as donors, or to allow them to continue to do so, if there is inadequate regeneration in the intervals between donations. We therefore consider that those responsible for voluntary donor services should provide for the examination of the hæmoglobin level of all volunteers, particularly women, before their acceptance, and for the careful supervision of those who repeatedly act as donors. It has been suggested as an alternative[14] that it would be simpler to give

TABLE V.

Hæmoglobin Levels after Iron Therapy.

Donor.	Age. (Yrs.)	Hæmoglobin Percentage on Enrolment.	Hæmoglobin Percentage at End of Donation.				Iron Therapy.	Subsequent Hæmoglobin Percentage.
			Second.	Third.	Fourth.	Fifth.		
1. Miss Y.		86 (12.1.41)	83 (27.5.41)	74 (10.10.41)			*Fe et Am Cit.*[1] Nov., 1941-April, 1942.	100 (10.4.42)
2. Miss A.	63	93 (12,12,39)			75 (15.9.41)	79 (5.1.42)	*Fe et Am Cit*, Jan., 1942-June, 1942.	94 (30.6.42)
3. Miss W.					83 (20.2.41)	79 (20.6.42)	*Fe et Am Cit*, June, 1941-Jan., 1942.	93 (—.1.42) Three subsequent donations without further therapy: 91 (16.2.42) 92 (1.7.42) 99 (29.11.42)
4. Miss Wh.	45	66 (29,10,42) (First donation; see note in text.)					"Colferrol" (0·5 drachm thrice daily), Nov., 1942-Mar., 1943.	85 (19.1.43) 102 (23.3.43)
5. Miss M.		100 (25.4.41)		77 (10.10.41)			*Fe et Am Cit*, Oct., 1941-Jan., 1942.	93 (24.1.42)
6. Mrs. M.				81 (2.6.41)	72 (20.10.41)		*Fe et Am Cit*, Oct., 1941-Dec., 1941.	104 (15.12.41) Three subsequent donations without further therapy: 106 (11.5.42) 94 (10.10.42) 96 (15.1.43)
7. Mrs. R.				80 (1.10.41)	83 (5.3.42)		*Fe et Am Cit*, Mar., 1942-April, 1942.	94 (23.4.42)
8. Mrs. T.	44			70 (23.10.41)	75 (5.3.42)		*Fe et Am Cit*, irregularly till Sept., 1942.	81 (11.8.42) 92 (8.10.42)
9. Mrs. F.	43	104 (4.7.40)		81 (17.10.41)	83 (29.4.42)		*Fe et Am Cit*, May-Aug., 1942.	85 (29.6.42) 91 (27.8.42)
10. Mrs. D.	44	90 (10,9.40)			73 (14.11.41)	60 (17.3.42)	"Ferromax" (1 tablet thrice daily), Mar.-Aug., 1942.	101 (25.8.42)
11. Mrs. R.	40		87 (22.5.41)	79 (27.10.41)	78 (17.3.42)		*Fe et Am Cit*, June-July, 1942.	92 (23.7.42)
12. Mrs. D.	25	88 (7.8.40)	66 (27.2.42)	73 (14.9.42)			*Fe et Am Cit*, Oct., 1942-Feb., 1943.	94 (8.2.43)

[1] The amount of *Ferri et Ammonii Citras* prescribed was 40 grains three times a day in all cases shown in this table.

iron to all donors. Unless it is controlled by actual tests, however, it is impossible to ascertain whether this procedure has had the desired results, and unless it is carefully handled from the "propaganda" aspect, it may, by its implication that blood donation is inevitably a harmful process, have an adverse effect on the recruitment of donors.

Summary.

1. The hæmoglobin level prior to the giving of blood has been estimated in a series of 4,110 men and 8,956 women between the ages of eighteen and sixty-five years, who have volunteered as donors for the blood transfusion service of the Victorian Division of the Australian Red Cross Society.

2. The average level of hæmoglobin was found to be 110·24% in men and 99·47% in women; these figures on the scale used are respectively equivalent to 15·43 and 13·93 grammes per 100 cubic centimetres of blood.

3. In a series of 815 men and 2,603 women, the average hæmoglobin level at different ages was determined. It was lowest in the lowest age group (eighteen to thirty years) and highest in the highest age group (fifty to sixty-five years) in both men and women. The range was from 108·6% to 109·7% in the men and 96·5% to 101·2% in the women.

4. No significant seasonal variation in hæmoglobin level was detected.

5. The hæmoglobin level in a series of 1,577 men and 3,957 women, who had given blood on two or more occasions at intervals of not less than three months, was also estimated. No significant difference was found between the hæmoglobin level of men before or after giving blood. In women, 4·14% had a hæmoglobin level of less than 85% before giving blood; this figure increased progressively after three or more blood donations to 9·75% of those who had given five or more donations.

6. Factors affecting iron metabolism, particularly in women, and theoretical estimates of the time required for regeneration after blood donations are discussed. Data gained from detailed observations in four cases are shown.

7. The effect of iron therapy is shown in 12 cases.

8. The reasons and need for supervision of hæmoglobin level in voluntary donors are emphasized and the role of iron therapy is discussed.

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SWIMMING-BATH CONJUNCTIVITIS, WITH A REPORT OF THREE PROBABLE CASES AND A NOTE ON ITS EPIDEMIOLOGY.

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Outbreaks of conjunctivitis among bathers have been described by European and American authors. Many of the cases are examples of a specific disease, a characteristic feature of which is the presence of inclusion bodies in the epithelial cells of the inflamed conjunctiva. These are colonies of the causative virus and consequently the disease is often called "inclusion conjunctivitis" or "inclusion blennorrhœa".

The clinical features are succinctly described by Duke-Elder[1] as follows:

> This is a type of follicular conjunctivitis caused by a filter-passing virus, of slow onset and leisurely clinical course, characterized by considerable hyperæmia, slight discharge and pre-auricular adenopathy, and ending in resolution. . . .
>
> It comes on slowly after an incubation period of 3 to 4 days, with a mild hyperæmia, which is succeeded by a slight swelling of the lids, a painless swelling of the pre-auricular gland, photophobia and considerable irritation. It usually starts unilaterally, the second eye being affected in 2 to 3 weeks' time. The conjunctiva becomes swollen and very highly injected. The disease reaches its acme rapidly in 3 to 4 days. The bulbar conjunctiva remains relatively unchanged; the tarsal conjunctiva is rough and loses its transparency so that the tarsal glands are hidden; and from the 7th to the 10th day the follicles appear, crowding the region proximal to the tarsus in close-packed formation. The inflammatory symptoms die down and disappear in from 3 to 4 weeks, but the mucous membrane remains thickened and hyperæmic for about 2 months. Four to six months later the appearance resembles folliculosis, and eventually the follicles themselves slowly disappear.

A rather longer incubation period—approximately seven days—is quoted from Thygeson's work by Van Rooyen and Rhodes.[2] Julianelle and Lange[3] give the period as three to twelve days in infantile cases.

Thygeson and Stone[4] found that the oral use of sulphanilamide cured the conjunctivitis rapidly. When the disease attacked newly born infants, an ointment of a 5% strength of sulphathiazole or sulphathiazole sodium applied six times a day was equally effective, and was the treatment of choice. For older children and adults the ointment alone was not always completely curative.

From time to time outbreaks of conjunctivitis attributed to swimming baths have occurred in Brisbane. For instance, in December, 1936, dozens of children attending a suburban school became ill with conjunctivitis and fever. The school baths were blamed.

Reports of Cases.

The following recent cases are reported. The patients were three boys—N., aged twelve years, his brother G., aged eight years, and a cousin J., aged eight years. During the morning of November 14, 1942, they spent several hours in a swimming bath, after which they had lunch at the home of one of them, and played together in a park for a short time. This was the only occasion on which the three were together for about a month.

Case I.—On November 21, N.'s left eye became red and swollen. In the course of a few days the conjunctiva, both palpebral and bulbar, became fiercely red and considerably œdematous. The cornea was not affected, remaining like a clear, sunken island amid a sea of inflammation. In view of the intensity of the inflammation, the amount of exudate was surprisingly small, although there was enough to glue the eyelids together during the night. The eyes were treated at first with a 10% solution of argyrol, and later with "Merthiolate" solution (1/1,000) and "Merthiolate" ointment. My impression was that the treatment had little effect on the course of the conjunctivitis. (The conjunctivitis of patient J., which was treated with boracic lotion, ran a similar course.)

On November 28, the eye, though still very red, was improving; on December 1 it was much better, and on December 3 very little redness remained on the bulb, though the lids were still swollen. This swelling gradually subsided, and the eye became symptomless. Beyond slight redness, noticed on November 26, the right eye did not become inflamed.

Four months later (April 9, 1943) examination of the eyes disclosed a mild bilateral folliculosis affecting both upper and lower lids. The conjunctivæ of the upper lids were slightly injected, and there was a "milky" patch at the medial angle of the left upper lid.

On November 21, 1942, the day on which the conjunctivitis began, there were no general symptoms. The following morning the head was aching, the tongue was coated and the breath was offensive; the temperature had risen to 102·4° F. and the pulse rate to 108 per minute. On November 23 further complaints were a slight sore throat and swelling of the nasal mucosa.

The fever remained moderately high for five days and then fell by rapid lysis (see Figure I). It was accompanied by general weakness; but the appetite remained fairly good throughout. No abnormal physical signs could be detected in the chest or abdomen.

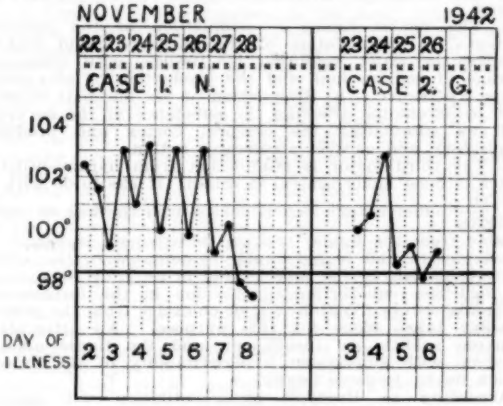

FIGURE I.
Charts showing the fever which accompanied the conjunctivitis of N. and G.

CASE II.—G.'s conjunctivitis began on the same day (November 21, 1942) as his brother's, and ran almost exactly the same course. It affected the left eye severely. Examination of the right eye revealed a little redness only. The fever lasted for only four days (see Figure I) and general symptoms were less pronounced. A mild folliculosis was still present four months later.

CASE III.—In the case of J., both eyes became inflamed, the right becoming affected on November 20, the left two days later. The course of the conjunctivitis was similar to that of the others; the febrile attack was almost identical with N.'s.

There can be no doubt that the conjunctivitis of the three boys arose from the swimming bath. After visiting there together (the only meeting of all three for a month) they developed similar infections simultaneously. Their eye symptoms corresponded in general to those of swimming-bath conjunctivitis—the incubation periods of six and seven days, the initial acute stage, the considerable hyperæmia, the slight discharge and the later stage of folliculosis. A difference from Duke-Elder's description was that the bulbar conjunctiva was severely affected, though less so than the palpebral conjunctiva.

The diagnosis of swimming-bath conjunctivitis is therefore probably correct, although it was not confirmed by the finding of inclusion bodies. These were, unfortunately, not sought during the period of acute illness; they could not be found in scrapings of the conjunctival epithelium later in the period of folliculosis.

In the literature available to me there is no mention of general symptoms accompanying inclusion conjunctivitis. In these cases, however, the simultaneous occurrence of fever in all three boys at the same time as the acute period of the conjunctivitis suggests strongly that it represented a general reaction to the same infection.

The association of fever and infected eyes following immersion in water suggested the possibility of leptospirosis. Accordingly the serum of N. and G., taken on December 1, 1942, was tested for agglutination with *Leptospira icterohæmorrhagiæ*, *Leptospira pomona* and *Leptospira mitis*, and the urine was examined for leptospiræ on three occasions. All these tests produced negative results. Actually the inflammation of the eyes in these cases was a much more intense happening than the injection seen with leptospirosis.

Discussion.

Chlorination of the Water.

The water of the swimming baths concerned is chlorinated. This is effected in an elevated circulating tank of 1,000 gallons' capacity. Water is pumped from one side of the pool through the tank at a rate of 12,000 gallons per hour and returned to the pool on the other side. As the pool has a capacity of about 75,000 gallons, this means that the total water circulates in six to eight hours. Chloride of lime and ammonium sulphate solution flow continuously into the tank. Testing of the water on the outlet side is carried out four times a day for its chlorine content and once a week for its bacterial count. The aim is to keep the residual chlorine (which is mostly in the form of chloramines) at 0·2 to 0·8 part per million—preferably at 0·5 part. The water is not filtered. It is changed once a week as a rule; with heavy loading it is changed twice a week.

There is no reason to doubt that the chlorination was conducted as efficiently as the method adopted would allow. The lessee has always taken a pride in the cleanliness of the water. On the morning of November 14, the test showed 0·3 part of chlorine per million; later in the day the amount was higher. Examination for bacteria on November 10 and 17, the nearest available dates, revealed no organisms. The weekly changing of the water would have taken place on the evening of November 15.

I have no information as to the exact degree of chlorination necessary to destroy the virus of swimming-bath conjunctivitis. As well as the concentration factor, there is to be considered the time lag, which would depend largely on the amount of cellular material and exudate surrounding the virus. It is unfortunate that these boys happened to come in contact with the virus during this lag period.

Epidemiology of Inclusion Conjunctivitis, Cervicitis, Urethritis.[1]

Inclusion blennorrhœa occurs not only as a swimming-bath infection. It may spread from patient to patient and also may affect the eyes of newly born infants. These are infected at birth from the genital canal of the mother. Inclusion bodies may be numerous in the cervical epithelium of the infected mother, although macroscopically the lesions in the cervix are slight.

A gynæcologist has developed inclusion conjunctivitis following a spurt of blood into his eye from a cervix on which he was operating.

Similar inclusion bodies have been found in the urethral epithelium of males suffering from urethritis. In one such case, subacute urethritis developed seven days after sexual intercourse; it later subsided, and gave rise to a chronic intermittent discharge which lasted for seven months before it healed completely. If such a patient urinated into a swimming bath, it is easy to understand how cases of swimming-bath conjunctivitis could arise.

Non-gonococcal urethritis is frequently encountered in Brisbane. It is likely that some of these cases are cases of "inclusion urethritis".

Acknowledgements.

I am indebted to Dr. J. Coffey, Deputy Director-General of Health and Medical Services, for permission to pub-

[1] For the information in this section I am indebted to Van Rooyen and Rhodes.[2]

lish this paper, and to Dr. W. L. Gibson, Dr. J. B. G. Gibson, Dr. G. Hayes, Dr. R. Weaver and Mr. W. J. Chamberlain for advice.

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Reports of Cases.

A CASE OF PERIODIC CONVULSIONS WITH HYPERVENTILATION SYNDROME BASE AND SOME CONSIDERATION OF THE SYNDROME.

By LEON OPIT,
Adelaide.

WITH the ever-increasing stress of modern times, the war situation and coincident problems in the field of "romance and finance", we must expect to see greater numbers of the already numerous anxiety neurotics. Many are met in general and special practice, with anxious symptoms suggesting, simulating or even associated with well-known diseases, so that the recent paper of M. D. Silberberg, of Melbourne, on "Sighing Dyspnœa and the Hyperventilation Syndrome"[1] was timely indeed.

Recently a patient was sent to me for electrocardiographic examination because of periodic convulsive seizures sometimes with and sometimes without loss of consciousness. The case prompts me to present some consideration of the problem, whilst at the same time stressing the usefulness of the hyperventilation test in the study and diagnosis of such conditions.

Carl Binger, in a paper entitled "The Psycho-Biology of Breathing",[2] makes the following statement:

> Our attitude towards disease is changing. It is no longer satisfactorily explained as a catastrophic invasion by noxious agents, a belief handed down to us not by bacteriologists alone but by our more animistic ancestors.

Kerr and his co-workers[1] have set out in a detailed presentation the mechanism responsible for the sequence of events they found in a group of patients who provided examples of several types of the anxiety states.

> Typically, all of these patients give a story of an encounter with some difficulty which causes emotional stress and anxiety. There is palpitation and tachycardia, hyperpnœa and a feeling of great weakness and fatigue. Within a variable period, there follow parasthesias of the hands and feet, and isolated muscular contractions which are associated with pain or tension similar to the symptoms mentioned in the patient's chief complaint. The characteristic local responses of what the patient complains are repeated quite regularly in successive attacks.

An analysis of fifty patients suffering from anxiety neurosis who were admitted to California Hospital since 1928 gives the following results.

Number of cases associated with hyperventilation	36
Number not associated with hyperventilation ..	14

Other Symptoms.

Weakness and fatigability	18 cases
Numbness and paræsthesia	14 cases
Palpitation and increased cardiac rate ..	12 cases
Dizziness	10 cases
Nausea and vomiting	4 cases

Muscular Contractions.

Twitching, trembling, convulsive states ..	14 cases
Tetany (not on basis of hypoparathyreoidism)	9 cases
Difficulty in swallowing, talking, breathing (pharyngo-laryngeal spasm)	8 cases
Precordial pain (intercostal muscle and diaphragmatic spasm)	4 cases
Dyspnœa (diaphragmatic spasm)	14 cases
Epigastric pain (diaphragmatic spasm) ..	2 cases
Constipation (spastic colon)	5 cases

Nearly 70% of psycho-neurotic patients have symptoms of hyperventilation tetany, either local or general.

Kerr *et alii* suggest that a problem of "romance or finance" faces the patient, who responds by solving it or neutralizing the fear by giving it a non-fear meaning. Otherwise it increases and anxiety is thereafter manifested; this produces anxiety concerning his health and further aggravates the fear and later the neurosis. Thus aggravation of symptoms is brought about and the autonomic nervous system is stimulated in preparation for the unknown situation. Chief response is through the sympathetic nervous system; the reaction of the parasympathetic system is less apparent.

1. The first factor is stimulation of the peripheral vascular bed with spasm of the arterioles leading to tissue anoxæmia, which, according to Davies, Haldane and Kennaway,[4] causes increased muscular irritability and thereby may produce tetany.

2. The second factor is stimulation of the endocrine system. (*a*) Stimulation of the pituitary gland leads to increase in water retention by tissues, with subsequent storage of sodium ions and the production of alkalosis in tissue hydræmia. (*b*) Stimulation of the adrenals causes a flow of adrenaline affecting the substance of the nerves as well as stimulating the cerebral cortex and producing respiratory and cardiac accelerator action.

3. The third factor is stimulation from hyperventilation, which is most likely central in origin. It has to do with the $\frac{HCO_3}{NaHCO_3}$ buffer action, and it varies with the loss of carbon dioxide from the lungs. Sodium bicarbonate is left in the blood stream and is not rapidly eliminated in the kidney, some being left in the muscle, and in an effort to maintain an acid-base equilibrium a reduction in the formation of ammonia occurs. Withdrawal of chlorides from the stomach possibly takes place for this purpose. All attempts to promote acidity are insufficient, and the tissue alkalosis persists, with subsequent hyperirritability of the muscles, which finally leads to tetany.

According to Brody,[3] hyperventilation will increase irritability of the cortex. Kerr and his co-workers state that hyperventilation affected their anxiety neurotic patients in greater degree than it ordinarily does those who over-breathe voluntarily. The difference is due to the synergistic effect that is present when hyperventilation is instituted after previous cortical stimulation from other sources. In such a state as that of fear or of any of the emotional reactions, adrenaline is probably the cortical excitant. This gives the hyperventilation test its clinical usefulness. The effects of hyperventilation have been proved to be twofold: (i) vasodilatation, central vasomotor stimulation, and (ii) vasoconstriction because of direct action on the vascular bed. In some cases the first mechanism seems to predominate and in others the second.

The following tabulation is taken from the paper by Kerr, Gliebe, Soley and Shock:[1]

Effects of Stimulation of the Central Nervous System.

1. Direct nervous effects, through—
   - (*a*) Sympathetic:
     - (1) rapid heart rate,
     - (2) increased blood pressure.
   - (*b*) Parasympathetic:
     - (1) blushing.
2. Hyperadrenalism (perhaps accentuated by direct sympathetic stimulation).
3. Spasm of the gastrointestinal tract, through—
   - (*a*) Sympathetic:
     - (1) cardiospasm,
     - (2) pylorospasm.
   - (*b*) Parasympathetic:
     - (1) spastic colon.
4. Hyperventilation. Probably resulting primarily from sympathetic stimulation (symptoms caused by respiratory alkalosis).

Dixon and Haugen[5] state that the anxiety tension syndrome includes the following complaints: (1) an aching

and drawing feeling in the back of the neck, or band-like constrictions at back of the head; (ii) occasional brief blurring of vision; (iii) periods of tachycardia, or extrasystoles, or the two in combination; (iv) sweating of the palms; (v) dryness of the throat; (vi) cold hands and feet; (vii) choking sensations, sometimes associated with a globus; (viii) gastro-intestinal disturbances, usually constipation, eructations or "heartburn". These symptoms they ascribe to continual stimulation of the hypothalamic nuclei.

The term "tetany"[8] covers a group of diseases, all characterized by increased excitability of the peripheral nerves with spasmodic contractions of the muscles of the extremities. The role of calcium in its causation is interesting, but speculative. In that produced by hyperpnœa, the amount of calcium is mostly normal. The common factor is the alkalosis, and it has been shown that an increase in the pH of the blood leads to a decrease in the amount of calcium existing as free ions. Alkalosis may be accounted for by (i) excessive intake of alkali or (ii) excessive elimination of acid. Here we are concerned with the excessive elimination of carbon dioxide, a weak acid, leading to an increase in the alkali reserve of the blood.

However, fully fledged symptoms are easily recognized if they are kept in mind; but there are a number of patients who have less pronounced and not so easily recognized signs and symptoms. By means of the hyperventilation test, help may be obtained in the diagnosis by the ready production of symptoms of tetany and by the relief that is brought about by reversing the loss of acid by the inhalation of carbon dioxide by rebreathing or by the use of acid salts or an acid ash diet.

After a complete history has been taken, one may try to obtain Chvostek's and Trousseau's signs.[9] Have the patient reclining in a comfortable position and instruct him to breathe at the rate of eighteen to twenty times a minute, the hand of the examiner being placed on the epigastrium regulating the rhythm. Note the time of onset of any symptoms from the commencement of hyperpnœa. An effort is made to produce tetany or to reproduce the main symptoms of the complaint. If the test is unsuccessful in thirty minutes, the procedure is discontinued. The spasms and symptoms are relieved by the use of carbon dioxide, by holding the breath or by rebreathing into a sack.

I believe that thirty minutes is too long a period to persevere with this test. I feel that if five to fifteen minutes' trial does not produce symptoms, one should not continue much longer, because it is just this ease of provoking symptoms that is so useful and characteristic in the diagnosis.

Often hyperventilation effects cannot be realized until the test is carried out. The patient sighs or complains of deep breathing and thus keeps the alkali reserve higher than normal, so when an emotional situation arises, symptoms of tetany, mild or otherwise, are brought on by increased breathing varying in different subjects and in different situations.

Guttman and Jones[10] make the following statement:

> No observer with some experience in psychiatric cases will fail to see the similarity between effort syndrome and an anxiety state.

They investigated 52 cases of effort syndrome divided into three groups—"the psychogenic, post-infective and the constitutional". The patient was questioned after ten minutes' over-breathing or when the patient refused to continue owing to tetanic or other symptoms. The signs and symptoms they found are as follows:

Paræsthesiæ	24 instances
Giddiness, dizziness, fainting feeling	27 instances
Headache	7 instances
Tremor	10 instances
Pain in the chest	6 instances
Oppression or shortness of breath	8 instances
Marked sweating	5 instances

In their discussion, Guttman and Jones distinguished anxiety neurosis, which may also include many cases of effort syndrome associated with irregular shallow breathing, and conversion hysteria in which the tendency is to hyperventilate. They summarize their findings thus:

> Fifty-two cases of effort syndrome have been hyperventilated—only in 50% of them were clinical symptoms reproduced in this way, and in these symptoms were those which one commonly associates with tetany, e.g., paræsthesiæ and disturbances of consciousness rather than those characteristic of effort syndrome. We feel that in view of our findings, we cannot support the contention of some workers that hyperventilation has an important place in the ætiology of effort syndrome.

Paul Wood, in his article in the *British Medical Journal* of June 7, 1941, states that the signs and symptoms of Da Costa's syndrome are produced by central stimulation, and that hyperventilation and hyperadrenalism, although symptoms concerned with the mechanism of symptom production, are not ætiological diagnoses. He suggests that the Da Costa's syndrome should be regarded as an emotional reactive pattern peculiar to psychoneurosis. Effort syndrome cannot be accepted as an adequate diagnosis. If it is thought expedient to draw attention to the incapacity for effort an example of a proper diagnosis would be "anxiety neurosis (effort intolerance)".

Clinical Record.

A.B.C., a female patient, aged fifty-five years, weighing ten stone, had had what she called "bad turns" for eight months. In these attacks she suddenly went stiff and convulsive; this state was followed sometimes by unconsciousness and she "came to" after five or ten minutes. The attack recurred in five or ten minutes' time. The next attack happened five months later; but this time it was associated with no loss of consciousness. She described "deep breathing, throbbing and 'pins and needles' in the hands up to the elbows". The last attack ten days prior to examination was similar to the previous one, with "pins and needles" all over her body.

The patient had suffered from rheumatism and sciatica intermittently for twenty-five years; she had had fibroid tumours; she said they had been "treated" with "diet, vegetables, and disappeared". Twenty years earlier she had complained of a lump on her breast; the breast was removed. Her mother was alive and well; her father had died of pneumonia at the age of sixty-five years. She had had six brothers, of whom three had been killed and the others were alive and well. She had also had three sisters; two were dead, one died of meningitis, the cause of the other's death was unknown. The patient had had no children and no miscarriages. The menopause had occurred three years earlier. The patient neither drank alcohol nor smoked tobacco.

She complained of shortness of breath on bending or doing housework; on further inquiry, this symptom was described as similar to a "deep breathing and palpitation or throbbing". She had never had "sighing respiration". Frequency of micturition at night time was another complaint; she was obliged to pass urine four or more times during the night.

On examination, the patient was seen to be a well-nourished woman, and active; her pupils reacted to light and accommodation. The tongue was clean and moist, the teeth were artificial and the throat was normal. No abnormal pulsations were observed in the neck. An old scar due to an operation incision for removal of a breast was present, and some consequent flattening on that side of the chest was noticed. Examination of the heart revealed no enlargement and no murmurs; the heart sounds were of good quality, and the mitral first sound was reduplicated. The blood pressure was 160 millimetres of mercury, systolic, and 95 millimetres, diastolic. A fluoroscopic examination revealed no significant abnormality. Examination of the abdomen revealed no abnormal mass, dulness or tenderness. The knee jerks were active, and no œdema of the ankles was present. The plantar reflex was flexor in type, and an examination of the urine showed it to be acid, to contain no albumin, no sugar and no pus, and to have a specific gravity of 1,018. A general neurological inspection, particularly in regard to the motor and sensory system as well as the reflexes, produced normal findings.

A fractional test meal examination revealed that the amount of fasting gastric juice was 62 cubic centimetres; there was no concentration of free acid. After the test meal there was no free acid at the half-hour; in one hour there was a concentration of only eight cubic centimetres of N/10 caustic soda *per centum*; four cubic centimetres were present in the one-and-a-half hour specimen, and there was none in the two-hour specimen; the total acid curve was correspondingly low.

An electrocardiogram taken after an attack of hyperventilation syndrome showed axis deviation within the range of normality; the *T* waves in the first two standard leads were upright and of good amplitude and that of the third was diphasic.

The patient's urine immediately before the hyperventilation test had a pH of 5·13, and immediately after the hyperventilation test the pH was 6·44; this shows a distinct shift to the alkaline side.

The hyperventilation test was carried out with the patient standing to allow the taking of a cinematographic picture.

She easily induced hyperpnœic breathing with the "pins and needles" in the hands within fifteen seconds and spasmodic contractions of the fingers within three-quarters of a minute; "seizures" (generalized convulsive movements) and almost loss of consciousness occurred within two minutes. Increased deep respirations (either voluntary or otherwise) came on, and she was forced to recline. She had no Chvostek's sign before the hyperventilation test, and it was only partially present during the hyperventilation test. Trousseau's sign was absent both before and during the test. The knee jerks became hyperacute during the test, and the feelings present during her "attacks" were reproduced in the course of the hyperventilation test. Rebreathing into a paper bag quickly relieved her spasmodic condition, but she felt rather exhausted that day.

On psychological inquiry it was found that there was a psychical basis for the condition (sexual frustration), owing to the impotence of her husband, of whom she was very fond.

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Reviews.

UROLOGY IN GENERAL PRACTICE.

"UROLOGY IN GENERAL PRACTICE", by N. F. Ockerblad and H. E. Carlson, is "the product of many years of endeavour to teach the speciality of urology to medical students and to interpret it to the profession in general."[1] "The manual was written to help the general physician do better those things that are within his province, and to suggest the limits beyond which the best interests of his patients require that he obtain the help of a specialist."

For the general purposes of its production, this book, which is liberally illustrated, should serve a useful role. The division into 21 self-contained chapters, with elimination of unnecessary padding, makes for ready reference and rapid absorption of the contents.

In combining both pyelitis and pyelonephritis in symptomatology and in treatment, the authors lay undue stress on "pyelitis", which in our opinion does not exist as a separate pathological entity and should be dropped completely as a diagnostic label.

The chapter on nephritis is an excellent *résumé*, the perusal of which cannot fail to widen the appreciation of the subject. Urinary lithiasis is treated at some length—a notable omission is detailed dietetic management to minimize recurrent formation. Exception is taken to the advocacy of routine two-stage suprapubic prostatectomy with an "irreducible minimum mortality of between 6% and 10%". In this country the "Harris" operation has been widely and successfully adopted with a mortality rate of from 3% to 5%.

The section on carcinoma of the prostate presents an excellent review of the modern concepts of treatment of this condition. A warning note against undue optimism is sounded. "There is then a ray of hope for the prostatic cancer patient. We wish to emphasize that it is only faint—the new day may dawn later."

The omission of infection and inflammation of the Skene's ducts—possibly the most common cause of recurrent attacks of frequency and scalding in the female—detracts from an otherwise excellent chapter on the "female urethra".

Some guidance on the investigation of sterility and impotency is welcome; they are dealt with at some length. The authors' opinions are advanced on the controversial subject of the treatment of ruptured kidney—an emergency operation is described in detail.

On the whole, this manual should prove an excellent ready reference to the busy practitioner, and a very useful *vade mecum* to the advanced student.

[1] "Urology in General Practice", by Nelse F. Ockerblad, B.S., M.D., F.A.C.S., and Hjalmar E. Carlson, B.S., A.M., M.D., F.A.C.S.; 1943. Chicago: The Year Book Publishers Incorporated. 8¼" × 5¼", pp. 383, with 98 illustrations.

MICRURGICAL AND GERM-FREE METHODS.

J. A. REYNIERS'S book consists of a series of papers contributed to a discussion on some special aspects of bacteriological technique that took place at the University of Notre Dame, Indiana, in November, 1939. It consists of eleven independent papers loosely related by their common concern with the technique of handling biological objects (ranging from tomato rootlets to babies) in the complete or nearly complete absence of microorganisms.

The treatment varies greatly from one section to another, some like the contributions of R. W. Glaser and P. R. White on the aseptic culture of some invertebrates and of plant tissues respectively being essentially semipopular surveys of these fields. Both are highly interesting. Glaser's account of the artificial culture of a nematode parasite on the notorious Japanese beetle and the application of these cultures to the practical control of the pest is particularly impressive. Other sections, particularly those on micrurgical technique, are of more strictly technical character and are likely to interest only those engaged in research on this very specialized subject.

The account by J. A. Reyniers of the methods employed in rearing aseptically guinea-pigs, monkeys and chickens provokes mixed feelings. The apparatus used is ingenious, amazingly complicated and obviously very expensive; it is patented in the United States, Great Britain, France and Germany. One can admire its successful production of a monkey who has lived for three months without a single *Bacillus coli* in his alimentary tract, but one would like to hear that some information at least indirectly relevant to human needs had come out of the investigation.

The three final sections are concerned with the relative virtues of mechanical and ultra-violet light barriers in preventing cross infection in hospitalized infants. A fairly complete account of the installations at the Cradle Infants Hospital in Chicago is given, but there is no information as to how effective the methods have been in practice. One can hardly quarrel with any attempt to protect sick children and infants from cross infection in hospital, but we wonder where this process of protecting the patient from air-borne infection is going to stop. There is adequate experimental and observational data to justify nursing all surgical patients and all children with scarlet fever or diphtheria as well as premature infants in air-conditioned individual cubicles screened by ultra-violet light barriers. It is another matter to decide whether a reduction in the number of cross infections is sufficient to balance the cost in skilled labour for the construction and maintenance of hospitals using such methods. One must not forget in making that balance that the patient must eventually return to a contaminated environment and that most hospital infections are amenable to chemotherapy.

However, there can be no doubt that the whole trend of American and English research is in the direction of such attempts to prevent the transit of air-borne infection, and these sections of the book give a good impression of the American approach to the problem of the infant's ward.

[1] "Micrurgical and Germ-Free Techniques: Their Application to Experimental Biology and Medicine: A Symposium", edited by James A. Reyniers; 1943. Springfield: Charles C. Thomas; London: Baillière, Tindall and Cox. 9¼" × 5¾", pp. 286, with 94 figures and 17 tables. Price: $5.00.

The Medical Journal of Australia

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THE AGED AND THEIR FOOD.

In these days when increasing attention is being paid to the individual by those who proclaim and practise preventive medicine, discussions on food and food values are common. The food of persons in different age groups is often the subject of comment, and the groups most often dealt with are those comprising infants, children and adolescents. Persons at the other end of life are not so often considered in this regard. This is perhaps somewhat surprising when we remember that expectation of life has been enormously increased since the beginning of this century and that from the community point of view it is desirable that every individual shall be able to make a contribution to the common weal. Apart from the fact that, without it, people in the later years of life are likely to be of little use to the community, adequate nutrition will possibly make all the difference between full enjoyment of life and mere vegetative existence, between reliance on self and dependence on others. The medical practitioner is often asked to give advice about the food of old persons, and though he will in general be guided by certain principles, his instructions will, as in any other therapeutic problem, vary with the general make-up, the past history and the environment of the patient. Medical works of forty or fifty years ago put forward certain general ideas on the subject of food and old people which have had an influence on thought and practice ever since. In Allbutt and Rolleston's "System of Medicine" the views of Cheyne on the restriction of the amount of food consumed by old people are quoted: "The aged should lessen the quantity and lower the quality of their food *gradually* as they grow older—even before a manifest decay of appetite force them to do it." This quotation follows the laying down of a general rule "that great moderation in the amount of food ought to be practised by everyone, especially with regard to the most nourishing articles of food (proteid food, including fish, eggs and pulses), and that this rule applies particularly to the aged". In the same work appears the statement that no truer apophthegm was ever uttered than that of the French physician who declared that "*on a l'âge de ses artères*". That food is commonly believed to have some relationship to the length of life, is shown by the well-known saying that after forty years of age most people dig their own graves with their knives and forks. Such an aphorism may be useful in pointing to the dangers of overeating, but, like other observations of the kind, must not be too harshly applied.

In the course of a recent discussion in these pages on the aged and their diseases it was remarked that the factors which bore fruit in old age were: to live in healthy surroundings, to be careful of personal hygiene, to stick to a balanced diet, to work hard but not too hard, to play with zest, and to train the mind to think. A man who does all these things when he is young is more likely to have a serene old age than one who does not; and to neglect one of them is to some extent to prejudice the future. But at the moment we are dealing with food and old age. The point to be remembered is that food habits of a lifetime are carried on into old age and according to their nature may have a good or bad effect. The term "balanced diet" has been well chosen; its meaning is obvious. There is no need to discuss the importance of trying to plan or to adjust the diet so that each of its constituents is present in the most desirable amount. We know from animal experiments that diets which are just good enough to allow a young animal to develop in what appears to be approximately a normal manner, may cause early aging and instability of the nervous system. Also, while growth is in progress or after it has ceased, the adherence for even brief periods of a few days or weeks to a diet which is unsatisfactory in some degree, leads, in the words of McCollum and Simmonds, "to a deviation from the normal histological structure of the osseous, the nervous or the circulatory tissues, depending upon the nature and extent of the faults in the food". Without pursuing this enormous subject further, we can conclude that dietary deficiencies spread over some years may produce in man changes that are not favourable to longevity. It is quite possible, for example, that the decay of appetite mentioned by Cheyne may itself sometimes be caused by dietary deficiencies of many years' duration. So far heredity, one of the most important factors, if not the most important, in the attainment of old age has not been mentioned. It has been said that the best way of being certain of reaching old age is to be born into a long-lived family. Old age is undoubtedly found as a family characteristic, but this observation does not carry us much further. Our knowledge of heredity is not very great. It might be argued that a family was long-lived because its members had always been well and wisely fed. Such an argument would, of course, be difficult to sustain, and in any case there is more to the question than proper or improper feeding. Actually heredity has no particular place in the present discussion, apart from the observation that members of long-lived families, when they reach old age, will be less likely to present dietary problems than those with a different heredity.

The feeding of aged people has recently been discussed by Edward L. Tuohy in a special article[1] of a series prepared under the auspices of the Council on Foods and Nutrition of the American Medical Association. Tuohy's

[1] *The Journal of the American Medical Association*, January 2, 1943.

views are important for the reason that he challenges the truth of statements like those quoted from Allbutt and Rolleston's "System of Medicine". He attacks what he calls the fallacy of food restriction for the aged. He thinks that the "less food for old people" fallacy may hinge on the supposition that for them energy for current expenditure is the chief item and that therefore carbohydrate and some fat with a minimum of protein suffice. This is the way, he holds, in which many old people exist but do not live. "All living creatures are interrelated and follow universal laws in their metabolism and growth. Life and its products are handed back and forth between living creatures (plant and animal). Nature has provided these laws of balance and coordination. Simpler organisms accept them, but man has varied notions of his own. . . . He misses the balanced assemblages plant life has integrated and domestic animals have concentrated for him. They do it better than he can plan it." Tuohy goes on to point out that human growth is not terminated when adult stature is attained. Rates of growth vary, but the process endures with life. Repair within the body is a continuous process; in such organs as the liver it may be extensive. " . . . reproduction of the individual as a unit is limited by age, but, in the cellular domain, active living processes demand nitrogenous equilibrium continuously." Another commonly accepted statement challenged by Tuohy is that a man is as old as his arteries. He dissociates aging from arteriosclerosis—the former is a natural process beginning before birth; the latter is an unnatural but common acquisition.

In the last section of his paper Tuohy gives "practical guidance". Expressed shortly, his idea is that old people should have a balanced diet in accordance with Nature's "nutritional formula" and that refinement and processing should be avoided. The need for protein at all ages is established and he thinks that elderly people should start the day with a good breakfast which should include a substantial portion of protein. As effort lessens and sedentary life takes its place, a rise or fall in weight should indicate how much carbohydrate should be taken. As much of the carbohydrate as possible should be obtained from the whole grain. Vegetables and fruits should act as "fillers" for the obese, and if they are meticulously prepared and served they should provide appetite and zest. Tuohy holds that the elderly should eat fat sparingly and that even the middle aged should use it with caution. Foods yielding a high percentage of cholesterol, such as egg yolk, cream and animal fats, should be curtailed whenever body build, family history and other signs suggest the advent of arteriosclerosis. Tuohy believes that if 10% of the necessary Calories for the inactive elderly person are derived from fat, the bodily need will be safeguarded. He also mentions vitamins and calcium and phosphorus. He questions the use of milk as a source of calcium for old people. They do not need the fat in whole milk and skim milk is constipating if taken in large amounts. Cheese, buffered with vegetables, is more practical.

Few, if any, will object to the general conclusion that old people should be given a balanced diet; and while some may hold that food restriction for the aged is not a fallacy, it is well to remember that most people in the middle years of life eat too much, and study their diet far too little. The diet of old people should be planned on a scientific basis—Tuohy holds that we must learn to grow old skilfully as well as gracefully—and it should also be planned with common sense. Tuohy, as already noted, uses the term "practical guidance" in connexion with his detailed discussion on proteins, carbohydrates and fats. And this is all that such discussions can ever be. In all matters of treatment it is the individual who must be considered, and if this is to be done rule of thumb methods must not even be considered. The truth is that (to use a contradiction in terms) the feeding of the aged must be started in middle life or before that stage is reached. Habits should be formed and adjusted in such a way that no drastic changes have to be made, no new habits acquired, as the years advance. And to this one final word must be added. The phrase "grow old gracefully" has been used. This implies a serene and peaceful mind, a quiet philosophical outlook. The relationship of the voluntary and the involuntary nervous systems which reflect the mind to the functions of the alimentary tract is recognized and is in fact being studied by many investigators. All that makes for harmony in this relationship therefore becomes increasingly important in the dietary treatment of the aged and widening fields of research are brought into view.

Current Comment.

AORTIC OCCLUSION.

Much remains to be learnt about the mechanism of arterial occlusion, whether the vessel be a small coronary artery or a great artery such as the abdominal aorta. One of the most remarkable arterial disasters that can befall a man is the so-called "saddle" or "rider's" occlusion of the abdominal aorta at its bifurcation. One might think that a study of a number of these cases would reveal much valuable information concerning the immediate cause of arterial occlusion. The results of a recent carefully considered investigation by Nathaniel E. Reich confirm this view; but the solution of the interesting problem remains incomplete.[1] Reich's work has been productive of much that is instructive and much that should encourage thoughtful people to apply themselves more earnestly to the elucidation of the many riddles of arterial disease and arterial disaster.

Reich entitles his paper "Occlusion of the Abdominal Aorta: A Study of 16 Cases of Saddle Embolus and Thrombosis". Actually he records eighteen cases.

He gives as the causes of aortic occlusion in his series: (i) embolism, (ii) thrombo-arteriosclerosis, (iii) abdominal aneurysm with mural thrombosis, (iv) infection. At this point we digress to decry Reich's habit of quoting percentages. For example, he states that abdominal aneurysm was the cause in 7% of cases. Actually it occurred in one case of fourteen that he analyses in the first part of his paper. If this habit of calculating percentages is carried to its extreme we might find that a man had observed such-and-such a change in 100% of cases, rather than in the one solitary case that he had seen. The danger here is that percentages rather than actual figures may be quoted and become embodied in standard works and accepted as true by the great body of medical practitioners.

Occlusion was caused by embolism more frequently than by thrombosis. With one exception all the patients in whom embolism occurred were sufferers from rheumatic heart disease and all but two were women. In addition the rheumatic patients were all but one suffering from auricular fibrillation. Presumably a "ball" thrombus formed in the auricle and provided the source of the embolus or emboli. Reich expresses the opinion that "when the embolus itself was not large enough to occlude

[1] *Annals of Internal Medicine*, July, 1943.

the aorta there undoubtedly occurred a more or less rapid antemortem thrombosis superimposed on the original nidus". Two of these patients recovered. The patients in this group, as might be expected, were considerably younger than those who were affected with degenerative arterial disease; because of this and the relatively healthy state of their arteries, their chances of recovery would obviously be better. In one remarkable case cardiac infarction was followed by embolism of the abdominal aorta. Reich believes that a thrombus formed on the wall of the heart at the site of infarction and this thrombus was the source of the embolus.

Thrombosis occurred as a primary cause of occlusion in grossly degenerated vessels. In one case "postoperative thrombocythæmia was a secondary factor in the deposition of a thrombus since it began to form on an aorta that was markedly ulcerated by an atheromatous process immediately following operation".

In some infectious diseases degeneration of the intima or media may occur; the degenerate area acts as a focus for the formation of a thrombus. Furthermore, "in inflammatory states there is a marked increase of the fibrinogen in the plasma and a decrease of the capacity of the blood to retain its corpuscles in suspension, thereby aiding coagulation".

A further point of general importance in thrombosis is hæmoconcentration from loss of fluids.

The importance of this factor arises from the physical fact that the velocity of a fluid in a tube is inversely proportional to its viscosity and directly proportional to the driving pressure to which it is subjected. The fact that thrombosis may occur in different blood systems of the body (e.g., pulmonary artery and portal vein . . .) also speaks strongly for the influence of these factors.

The onset of symptoms was sudden in Reich's series. Sudden severe pains in the lower limbs occurred in the majority of cases. At times the pain radiated to the lower part of the back or the groins or the "girdle area". "It varied in intensity from slight to severe, and was described as excruciating, sharp, stabbing, dull or aching". Shock was noted on several occasions. Temperature and colour changes were almost invariably noted. The colour was "variously described as black, cyanotic, mottled, blanched, blue, pale or white". The limbs became cold. Superficial gangrene and bleb formation were rarely noted. The absence of pulsation in the vessels of the lower limbs was not an invariable sign. Impairment of function of the lower extremities varied from weakness to paraplegia. Loss of sensation was a frequent occurrence. In some cases sensation was increased at first but lost later. In a number of cases the deep reflexes were lost.

Diagnosis is not always easy, because in some cases signs and symptoms pointing to occlusion of the aorta or blockage of the blood supply to the extremities are completely absent.

This can be explained on the rapid formation of an occlusive process shortly before death when painful stimuli were not prominent while thrombus formation was more rapid because of slowed circulation and other factors previously described. There was insufficient time for visible changes to develop in the extremities or the patients went into sudden shock or coma and died very shortly thereafter.

In two of Reich's cases a diagnosis of some acute intra-abdominal crisis was made. Aortic occlusion was unsuspected in these two as in two other cases.

The occurrence of embolism or thrombosis elsewhere should arouse suspicion of the possibility of aortic occlusion. Other aids to diagnosis are oscillometer readings, Landis-Gibbon tests, platelet counts, the estimation of plasma coagulation time, and estimation of the serum globulin content.

The duration of life varied from six hours to one month after the onset of acute symptoms. Recovery, as a result of organization and canalization of the occluding material, is not unknown.

The treatment in Reich's series consisted in the administration of papaverine and other vaso-dilators and the use of an oscillating bed. Reich suggests that heparin may be of value. Embolectomy was not performed in any of his cases. Most of his patients applied for treatment too late or were suffering too severely from shock or circulatory failure for operation to hold out any hope of success. One measure in prevention is mentioned.

When a person to be operated upon is known to have marked arteriosclerosis . . . it may be advisable to increase the water content in the blood by abundant drinking, or by administration per rectum, since an excessive concentration of plasma protein favors the inception of thrombi. A diet low in protein reduces the fibrinogen content of the blood. These measures are of added importance when there are indications of cardiac decompensation, especially of auricular fibrillation and a history of previous attacks of thrombosis or embolism elsewhere.

As an example of the pathological changes that may be noted, the following is quoted from one of Reich's post-mortem records:

. . . the left auricle was markedly dilated, whereas the left ventricular cavity was small. . . . There was marked thickening and fusion of the mitral valve with stenosis and insufficiency. It was free of old or recent vegetations. There were no thrombi present. The intima of the aorta was bright yellow and smooth. Just below the opening of the cœliac axis extending down to the external iliac arteries, the lumen of the aorta was completely occluded by a firm, red-gray, friable thrombus. This mass extended down into the smallest branches of the superior and inferior mesenteric and splenic arteries. The mass was adherent throughout to the arterial walls and varied considerably in shade from place to place. . . . there were large infarctions of the kidneys, spleen and in the left hemisphere of the brain. . . . The final diagnosis was inactive rheumatic heart disease with mitral stenosis and insufficiency, with embolization to the abdominal aorta, and thrombosis of the mesenteric, iliac, splenic and renal arteries.

In other cases thrombosis was found to have occurred in an artery that was grossly diseased. The thrombus varied considerably in size; but it commonly extended from a point several centimetres above the bifurcation down into both common iliac arteries.

Reich deserves congratulation on his work, which not only draws attention to the features of a remarkable arterial disaster (perhaps not such a rarity as it is commonly believed to be), but also stimulates thought on the important problems of arterial disease and intravascular thrombosis. Among the questions to be asked are these: Why does clotting occur in a fibrillating auricle? If it occurs in some cases, why not in all? Why are there not always signs of embolism in auricular fibrillation?

Reich's paper should be read by all who are able to lay hands on it.

BALL THROMBUS OF THE AURICLE.

BALL THROMBUS is a rarity even in the post-mortem room. Clinically it is a curiosity. David M. Spain has recently reported a case in which the correct clinical diagnosis was made.[1] His patient was a woman, who had suffered from dyspnœa for two years and had been given digitalis prior to coming under Spain's observation. She suffered from a febrile disturbance associated with a pulmonary infection. Obvious signs of mitral stenosis were present; but the auricle was not fibrillating. On one occasion the patient suddenly experienced coldness and numbness of the right hand. The radial pulse disappeared temporarily. Variability of the pulse of the *dorsalis pedis* artery of either side was noted. On several occasions the patient experienced transient coldness of all four limbs and faintness. The fever continued. The patient coughed bloody sputum and died forty days after admission to hospital. Post-mortem examination revealed great dilatation of the left atrium, advanced stenosis of the mitral valve, and the presence of a ball-like thrombus about three centimetres in diameter, within the atrium and attached to the atrial wall by a long, thin, friable pedicle. Spain suggests that the "transient episodes of interference with the peripheral circulation were probably caused by intermittent partial obstruction of the mitral orifice by the ball thrombus". No doubt the infection was largely responsible for the clotting.

[1] *Annals of Internal Medicine*, July, 1943.

Abstracts from Medical Literature.

GYNÆCOLOGY.

Pruritus Vulvæ.

W. J. Reich, Helen Button and M. J. Nechtow (*American Journal of Obstetrics and Gynecology*, June, 1943) present a preliminary report of a new form of treatment of intractable *pruritus vulvæ*, which they have used successfully in fifteen cases. The treatment consists of the injection of a solution of procaine (2%), benzyl alcohol (5%) and a vehicle, which may be olive, peanut or almond oil. The solution may be warmed, to make the injections easier and to permit the use of a thinner needle. The injections are made according to the following technique. The pubic and vulvar hair is not shaved. The vulva is cleansed with green soap and flushed with water; alcohol is not used, because it causes too much burning. The injections are made in four directions: along the length of the *labia majora* and *labia minora* on both sides, across and above the area of the clitoris, and across the lower portions of the vulva above the anal region. The needle used is 21 gauge, two-inch or spinal; one-quarter of an inch away from the usual inflamed border laterally, it is introduced at the upper pole of the labia and is carried down to the lower pole before the injection of the solution is actually begun. When the point of the needle is felt at the lower angle, then the oil is injected, and the needle is gradually withdrawn upwards until the upper pole of the labia is reached. The injection is made fairly deeply into the fatty parts of the labia. Five cubic centimetres are used for each labium laterally, and 2·5 cubic centimetres for the upper and lower injections. Occasionally a vein is punctured and a hæmatoma develops, but this is not a serious complication. No infection has occurred in the authors' series of cases. In from three to seven days the subjective symptoms are much diminished or have completely abated, and the patient is relieved. Occasionally in a severe case a second injection may be required; half the original amount of solution is used, and the second injection is not given earlier than two or three weeks after the first. The authors recommend warm baths and washing of the vulvar parts with soap and water after the injections are given, to eliminate the secondary infection that is often present prior to the treatment and is due to scratching.

Carcinoma of the Vulva and Vagina in Infancy.

R. H. Hoge and V. A. Benn (*American Journal of Obstetrics and Gynecology*, August, 1943) briefly review the literature and present a case of carcinoma of the vulva and vagina in infancy. The patient first showed signs of the lesion at the age of five months, and the diagnosis was made on microscopic evidence when she was twenty-one months old. At that time she was admitted to hospital with a friable, easily bleeding cauliflower mass, somewhat spherical in shape, the centre of which was at the lower portion of the introitus near the posterior commissure; the diameter of the growth was five centimetres. The tumour extended into the labia on each side, more so on the left, and it included the sites of the ducts of Bartholin's glands. The mass extended into the vagina for a distance of about 2·5 centimetres above the introitus, and involved the posterior and lateral walls of the vagina; the anterior wall was unaffected. The cervix was not involved. Some areas of the tumour were so soft that semi-solid tissue exuded on pressure, but smaller areas were harder. In the left side of the pelvis, and palpable through the vagina, was a firm, bean-shaped, movable mass, about one centimetre in length, which was believed to be an enlarged iliac lymph gland. Smaller shotty glands were palpable in each inguinal region. Microscopic examination of tissue from the lesion revealed adenocarcinoma, Grade IV; examination of a small lymph gland excised from the left inguinal region disclosed tuberculous adenitis. The patient was treated with radium applied interstitially, and by deep X-ray therapy. The growth disappeared under treatment, but at the age of three years the patient died from metastatic carcinoma. The authors draw attention to the rarity of carcinoma of the female external genitals in infants.

The Female Obstructing Prostate.

A. I. Folsom and H. A. O'Brien (*The Journal of the American Medical Association*, February 20, 1943) briefly review the literature and discuss bladder neck obstruction in the female. They believe that an infection harboured for years in the group of glands surrounding the posterior part of the female urethra is the cause of the "bizarre pathologic picture" seen in this part of the female urethra. Prostatism in their opinion is a clinical entity that occurs in women much more frequently than it is recognized and properly treated; it can cause all the clinical symptoms that are seen in similar conditions in men. The chief complaints of the patients are of bladder irritation and some degree of difficulty in micturition. This ranges from "a sense of obstruction and unfinished business" to complete retention of urine. The urine may appear entirely normal, or it may be heavily loaded with pus. A plain cystogram taken after the injection either of air or of sodium iodide will frequently reveal a filling defect in the region of the internal orifice, similar to the defects accompanying prostatic hypertrophy in the male. Cystoscopic examination may show the bladder wall to be either normal or grossly trabeculated, with cellules and even diverticula and calculi. The authors think that the best inspection of the bladder neck is made by the use of both the close vision cystourethroscope and the panendoscope; the retrograde lens may be of use in evaluating a "collaret" type of enlargement. Often the bar or "collaret" may be felt by palpation of the urethra through the vagina, the cystoscopic sheath being in position. In the majority of the authors' cases fibro-muscular hypertrophy is present, with fibrous hyperplasia and varying grades of inflammatory reaction. The same applies to cases in the literature; actual gland structures have been reported, which seem to be identical with similar lesions in the male. The ætiology of the lesion they consider to be as follows: (i) a homologous group of glands surrounding the posterior part of the female urethra exists; (ii) these glands become infected; (iii) after this infection has been present for months or years, bars, "collarets" and cicatricial contractions are produced. The lesions lend themselves readily to transurethral resection, and the results are as satisfactory as in the male. The technique of the operation on the female needs to be more careful, for three reasons: (i) since the female prostate is a miniature of the male gland, smaller bites of tissue must be removed, lest the urethro-vaginal septum be cut through; (ii) there appears to be no capsule to act as a guide during operation; (iii) excessive fulguration may be as bad as too deep a cut.

Tuberculosis of the Female Genital Organs.

Oscar Auerbach (*Surgery, Gynecology and Obstetrics*, December, 1942), in 571 consecutive autopsies, found 52 cases of tuberculosis of the female genital organs. In no case was the primary focus in the genitals. The study covers the period from January, 1933, to July, 1941. The ages of the subjects ranged from two to fifty-six years; 36 subjects were aged between twenty and thirty-nine years. Two subjects were Porto Ricans, 23 were Negroes and 27 were white women. In the series of 571 autopsies, the ratio of Negro subjects to whites was 4:7. In the 52 cases of genital tuberculosis, the Fallopian tubes were involved in 49 cases, the uterus was involved in 29 cases and the vagina in two cases, and the ovaries were involved in 15 cases. Both Fallopian tubes were affected in 46 cases; the abdominal ends were first and most extensively involved. Tuberculosis of the Fallopian tubes in this series was the result of hæmatogenous tuberculosis; the hæmatogenous spread occurred during a fresh primary complex from extrapulmonary organ tuberculosis or from chronic pulmonary tuberculosis. In the early stages the size, shape and form of the Fallopian tubes were unaltered; as the disease progressed the tubes became thicker and softer in consistency, and on cross section were found to be almost entirely caseous. Tuberculous peritonitis occurred 26 times in the series. The peritonitis resulted in a matting together of the Fallopian tubes and the surrounding structures. The tuberculous process in the tubes began with a focus in the wall; this perforated into the lumen and caused a spread to the remainder of the tube. In three cases healing of the tubes occurred, twice with calcification and once with early scar formation. In 26 of the 29 cases of uterine tuberculosis, the condition was the result of an intracanalicular extension from the tubes; examination of the uterus revealed decreasing intensity of the process from the fundus towards the cervix, which was frequently involved. Even when the disease was extensive the size and shape of the uterus were rarely altered. The tuberculous process was usually limited to the endometrium, but some-

times extended into the myometrium. In three cases the tuberculous process was part of a hæmatogenous dissemination; the foci were in the uterine wall and were not related to tubal tuberculosis. In all the instances of ovarian tuberculosis both ovaries were involved; the involvement resulted from an extension from the surrounding structures. The vagina was infected from the Fallopian tubes, and was found to contain ulcers and nodules, which increased in intensity from above downwards. The author doubts the occurrence of primary tuberculosis in the female genital organs.

OBSTETRICS.

Vitamin A and Carotene Content of the Newborn Infant's Plasma.

C. J. LUND (*American Journal of Obstetrics and Gynecology*, August, 1943) has studied the vitamin *A* and carotene concentration of newborn infants' plasma. He found that the vitamin *A* concentration in the plasma was approximately one-half that of normal adult plasma. The plasma vitamin *A* content of the newborn infant was independent of that of the mother, regardless of the mother's intake of vitamin *A*. Low maternal values were not reflected by the fœtus, and in many such instances the fœtal values were similar to or higher than those of the mother. The administration of excessive amounts of vitamin *A* to the mother raised the concentration in her own blood, but was without effect on that of the fœtus. The vitamin *A* content of the plasma of infants who were below average weight was usually low, while that of infants above average weight varied within the normal limits. The concentration of carotene in plasma from the umbilical cord of newborn infants was approximately one-tenth that of maternal plasma when this was of average amount; it was one-eighth the maternal value when this was low, and one-twelfth the maternal value when this was high. The fœtal plasma carotene concentration varies regularly with the maternal plasma carotene concentration, and can be estimated with considerable accuracy. No relationship was found between the fœtal plasma concentrations of carotene and vitamin *A*; yet this fact does not necessarily exclude carotene as a precursor of fœtal vitamin *A*. Vitamin *A*, unlike carotene, either is not transmitted or is poorly transmitted from the mother to the fœtus. In this respect it resembles certain lipids, and the transmission of vitamin *A* through the placenta may be related to or limited by lipid metabolism at the placental barrier. The newborn infant requires an adequate supply of vitamin *A* during early life. Human colostrum and early breast milk are the ideal sources; but if cow's milk is substituted, additional vitamin *A* must be given.

Post-Maturity.

L. S. RATHBUN (*American Journal of Obstetrics and Gynecology*, August, 1943) presents an analysis of 250 cases of post-maturity. For this study, post-maturity was considered to be present if the patient was 295 days or more beyond the first day of her last menstrual period, or in other words, fifteen days or more beyond her expected date of confinement. Any patient was excluded who was not sure of her last menstrual period, or whose uterus at the time of her first visit to the clinic (usually at four to six months of pregnancy) was not consistent in size with her menstrual dates. The author also studied a series of 186 consecutive stillbirths, with the object of discovering whether post-mature infants are more inclined to die for no apparent reason than are infants born at term. Post-maturity occurred once in 13·2 deliveries, and post-mature infants were significantly heavier at birth than were babies born at term; however, they seemed to lose the tendency to gain in weight after they were twenty days post-mature. The increase in fœtal weight was accompanied by an increase in the duration of labour, an increase in the operative rate, especially with regard to the more serious operations, and a pronounced increase in maternal morbidity. The stillbirth rate was increased in post-maturity; the increase was in the number of deaths occurring with some obvious cause, rather than in the number of those for which no cause except post-maturity was apparent. The children born dead were on the average more post-mature than were those in the general series; they averaged 24·4 days beyond term as against 19·6 days for the 250 cases. Amongst the babies who were born alive, there was no increase in the neonatal death rate, nor was there an increase in difficulty in the post-partum period. The author is unable to answer the question as to what should be done about post-maturity; the difficulty associated with it is not sufficient to demand drastic measures. However, the existence of post-maturity should be realized, and each case should be judged on its merits. If the condition of the cervix is favourable, induction of labour is indicated; if it is not, then the size of the fœtus must be carefully compared with the size of the mother's pelvis, and a close watch must be kept on the increasing size of the fœtus. No more fear that the fœtus will be lost *in utero* without cause need be entertained than is associated with delivery at term. However, failure to appreciate the fact that labour may be more difficult and failure to prepare to meet the increased difficulty may cost the baby its life or the mother hers.

Cephalic Version in the Treatment of Breech Presentation.

G. H. RYDER (*American Journal of Obstetrics and Gynecology*, June, 1943) makes a plea for the more general use of external cephalic version in breech presentation; he bases his remarks on the results obtained in the consecutive deliveries of 1,700 women. The incidence of breech presentation in this series was about one in six amongst women with viable babies; this high figure is due to the fact that the author recorded all breech presentations when the diagnosis was made once, even though the presentation possibly changed later to vertex. At the time of labour, the incidence in the series was 1 in 37; the decrease was due partly to spontaneous version, but chiefly to external cephalic version. The author points out that breech presentation is a potential danger to the fœtus. The danger can be removed by early external cephalic version. Reliance should not be placed on spontaneous version, or individual babies will suffer. Success in external version depends on early diagnosis of the presentation by careful palpation. Doubt can usually be resolved by vaginal examination and always by radiological examination. External version should be performed gently and without haste; if it cannot be accomplished without force, the attempt should be abandoned. If carefully performed, the operation is not dangerous to fœtus or mother. If the attempt is made early, usually anæsthesia is unnecessary. The most frequent cause of failure is delay in making the attempt until late in pregnancy; the next most frequent cause is an extended position of the fœtal legs. The most favourable time for performing external cephalic version is in the sixth and seventh calendar months of pregnancy; breech presentations should not be allowed to persist beyond the seventh month without attempts at version. After this time, spontaneous versions are less likely to occur, and attempts at artificial version are more likely to require anæsthesia and to be failures. External cephalic version, systematically employed, can reduce the fœtal mortality rate associated with breech presentations to approximately the same figure as that associated with vertex presentations.

Absorption of Sulphonamides during Labour.

HAROLD SPEERT (*Surgery, Gynecology and Obstetrics*, December, 1942) has investigated the absorption of drugs of the sulphonamide class during labour. Three groups of women in labour were given, respectively, a single large oral dose of sulphanilamide, sulphathiazole and sulphadiazine. Estimation of the blood concentration of the drug showed the level to be much lower than the therapeutically effective concentrations resulting from the administration of a single large dose of one of these drugs to patients not in labour. This impairment of absorption was noted uniformly among patients to whom sulphathiazole and sulphadiazine were given; but it occurred in only four of sixteen patients who had received sulphathiazole. Similar doses of sulphanilamide and sulphadiazine, respectively, were administered to the same patients during the puerperium; prompt absorption occurred, with the establishment of effective blood concentrations. The author made a further test by giving to women in labour similar doses of sodium sulphathiazole and sodium sulphadiazine by intravenous injection. High blood levels immediately resulted, and a therapeutically effective concentration was maintained for at least six hours in the case of sodium sulphathiazole and for considerably longer in the case of sodium sulphadiazine. The author concludes that during labour sulphonamides given by mouth are poorly absorbed from the gastro-intestinal tract, and that when rapid chemotherapeutic action is required in intrapartum infections the drugs should be given parenterally.

British Medical Association News.

VICTORIAN BRANCH NEWS.

The following statement is published at the request of the Medical Secretary of the Victorian Branch of the British Medical Association for the information of Branch members.

Illnesses Characterized by Gastro-Intestinal Symptoms.

The Commission of Public Health has rejected a proposal that "infective diarrhœa", defined as "a feverish illness accompanied by diarrhœa and often vomiting, lasting more than one day and not associated with any primary infection (such as throat, chest, ear or urinary tract)", should be made a notifiable disease, it being considered that little would be gained thereby, as the only clear-cut bacteriological entity in infantile diarrhœa in Victoria is the *Bacillus dysenteriæ*, which is already notifiable.

The Commission, however, and the Executive of the Branch Council support the suggestion of the Director of Agriculture that medical practitioners consulted concerning illnesses characterized by gastro-intestinal symptoms and affecting more than one person in a family, home or larger community, and which they suspect might be milk-borne, should inform the Department of Agriculture, to enable it to take any necessary action with regard to the milk supply.

Conferences on Political Affairs.

As The Institution of Engineers, Australia, considers that professional men should more actively participate in public affairs, it has decided to hold a series of three conferences, at which there will be a programme of lectures followed by discussions on "The Fundamentals of Political Affairs".

The first conference, which members of the British Medical Association are invited to attend, will be held at the Public Lecture Theatre, Arts Building, University of Melbourne, on Saturday, October 30, 1943, at 3 and 7.30 o'clock p.m.

The speaker at the afternoon session will be Mr. G. A. Paul, M.A., Lecturer in Philosophy, University of Melbourne, and the subject, "Scientific Politics or Pitfalls in Political Thinking". At the evening session Mr. C. R. Badger, M.A., Director, University Extension Board, will speak on "The Modern Political Scene or Splitting the 'Isms'".

Members of the British Medical Association who wish to attend the conference should notify the honorary secretary, The Institution of Engineers, Australia, 55, Collins Place, Melbourne, not later than October 27, 1943.

Treatment of Norwegian Seamen.

The following is an extract from a letter received from the Consul for Norway:

> In order that the treatment of Norwegian seamen ashore may be controlled and, more particularly, to ensure that medical men who treat Norwegian seamen may do so in full confidence that their accounts will be met, it has been found necessary to institute a scheme by which a Norwegian seaman presenting himself to a doctor for treatment or consultation must, at the same time, hand to the medical man concerned either a requisition from the master of the vessel on which the seaman is employed, or a requisition (as far as Melbourne is concerned) signed by me in my capacity as Norwegian Consul or Melbourne representative of the Norwegian Shipping and Trade Mission.

Medical Societies.

MELBOURNE PÆDIATRIC SOCIETY.

A meeting of the Melbourne Pædiatric Society was held on July 14, 1943, at the Children's Hospital, Carlton, Dr. Wilfred Forster, the President, in the chair.

Congenital Laryngeal Stenosis.

Dr. Raymond Hennessy showed a boy, aged seventeen months, who had never cried. The child went through all the pantomime associated with crying, but made scarcely a sound. Very little stridor and no dyspnœa were present. The child was first examined laryngoscopically at the age of three weeks, and although technical difficulties were great, a diagnosis of webbing of the vocal cords was made. At the age of fourteen months, aphonia was as pronounced as before. Slight inspiratory stridor was audible and there was slight dyspnœa, with slight retraction of the lower ribs. Otherwise the child was quite well, and in the meantime had been safely circumcised.

Dr. Hennessy said that the webbing was attributable to over-development of the thyreoid cartilages where they normally met, rather than to failure of division. It was generally associated with a good deal of sub-glottic narrowing, and strictly, should be termed congenital stenosis of the larynx. Treatment at this stage was conservative. Children of the patient's age did not stand well operations on the larynx, though at a later date operation might be contemplated. It was not simply a matter of perforating a "diaphragm", since the fissure was a deep one. External operative procedures usually ended in severe laryngeal stenosis. Dr. Hennessy said that the prognosis was apparently not good; but he had had insufficient personal experience of the condition to speak with authority. The disorder had to be differentiated from congenital laryngeal stridor and laryngeal papilloma. The voice was unaffected in the former and the prognosis was good. Laryngoscopic examination revealed the latter. The only other case Dr. Hennessy could recall was that of a baby at another hospital twenty-five years earlier. It was suggested at the time that the child's aphonia was due to mental deficiency, but looking back on the case, Dr. Hennessy believed it fell into the same category as that of the patient under discussion.

Dr. H. D. Stephens said that he had seen many instances of laryngeal stridor in the newborn. He could not recall, however, a case comparable to the one under discussion. In congenital laryngeal stridor, the stridor occurred during inspiration, rib retraction was present and the voice was unaltered. These patients spontaneously recovered before the age of two years. Dr. Stephens wondered whether the cry was the distinguishing feature. He suggested that small graduated intubation tubes might be of assistance.

Dr. Robert Southby said that he regarded the condition as one of webbing. He had seen congenital webbing described as occurring either between the anterior ends of the cords with aphonia, or extending further to half the length of the cords with hoarseness, high-pitched voice and attacks of cyanosis. According to the description given, the webbing might be double.

Dr. Hennessy, in reply, said that Dr. Stephens was quite right when he said that the effect on the voice was the differentiating factor from the relatively common condition of congenital laryngeal stridor. A foreign body in the larynx declared itself by loss of voice or alteration in the voice. This did not apply to a foreign body in the trachea.

Tuberculous Otorrhœa.

Dr. Hennessy's second patient was a child, aged fifteen weeks. The mother was at the time in hospital, suffering from bilateral pulmonary tuberculosis. The baby had been born six weeks prematurely. At six weeks the child's right ear began to discharge, and left facial palsy developed with enlargement of the left upper cervical glands. These glands were superficially situated over the parotid salivary gland and in the left anterior triangle of the neck. Soon a discharge appeared at the left ear and the palsy began to decrease. The diagnosis was confirmed by examination of the discharge. Tubercle bacilli were demonstrated in a smear, and were easily grown on culture by Dr. Reginald Webster. The first X-ray picture of the lungs was reported as normal; but subsequent films showed bilateral miliary tuberculosis. The Mantoux test produced a strongly positive reaction. The nature of the mother's condition had not been suspected at first, and the child was allowed to go to the breast at intervals of four hours for no longer than five days. Dr. Hennessy said that some authorities regarded tuberculous *otitis media* as a Eustachian tube infection. Dr. Reginald Webster believed that almost certainly a latent focus existed elsewhere in such cases. The subsequent radiological findings in the lungs confirmed this view. Dr. Hennessy reminded his audience that the symptom-complex in these cases was facial palsy, permanent or evanescent, adenitis as described, and the characteristic discharge. This was not like ordinary pus, nor was it like the smegma of the newborn, but lay rather in between the two.

Dr. H. J. Sinn said that the child's condition must rank amongst the rarities of medicine. However, he had in his

care a male child, aged eight years, suffering from recurrent bronchitis. There was a family history of tuberculosis, and the Mantoux test produced a strongly positive reaction. During the year the child developed what appeared to be ordinary *otitis media* with a purulent aural discharge. This subsequently ceased; but a swelling developed in the meatal canal. Dr. Sinn took this to be a meatal abscess. Dr. Hennessy saw the child, diagnosed an aural polypus and removed it. The section was reported on by Dr. Webster as tuberculous granulation tissue. Dr. Sinn said that at the time of the meeting the ear was quite clear and no deafness was present. He wondered whether this was a case of tuberculous *otitis media*, and if so, whether the prognosis was quite as gloomy as they had been led to believe. One came across many cases of discharging ears. Was there anything characteristic about the discharge of tuberculous otitis? Could the diagnosis be made on the nature of the discharge alone, apart from the facial palsy and the adenitis?

DR. KATE CAMPBELL said the case raised the question as to the time at which infection took place—whether it was intrauterine or extrauterine. She believed the former pertained in the case under discussion. She had encountered three proven cases of intrauterine infection. In these three cases the infection was generalized, and not localized as in the present case.

DR. ROBERT SOUTHBY said that he also was interested in the mode of infection. Acute coccal infection usually occurred along the Eustachian tube. It was scarcely likely that breast milk would reach this area. It was more likely that infection would result from kissing. In view of the short period of contact and the nature of the adenitis, he was inclined to think the infection was intrauterine.

Dr. Hennessy, in reply, said that he could not recall the case quoted by Dr. Sinn. There was nothing absolutely typical in the discharge. A thin, limpid discharge was suggestive. It was evil-smelling. Examination and culture of the discharge were necessary for diagnosis. If the ear could be cleaned, perforation of the drum was frequently seen to be multiple. Facial palsy was commoner in children. In children also, the mastoid often became involved. In such cases, sequestra might form and work their way out to present externally.

Pseudohermaphroditism.

DR. H. L. STOKES showed a child, aged two years, who had been normal at birth and had developed normally until the age of eighteen months. During the last six months the clitoris had begun to hypertrophy, and growths of pubic hair had occurred during the last six weeks. Dr. Stokes said the condition was a good example of the adreno-genital syndrome. The pseudohermaphroditism was incidental. The condition developed from overgrowth or over-secretion of the adrenal cortex or hypernephroma. This might arise in adrenal rests in the broad ligament, near the kidney, in the testis *et cetera*. When these symptoms arose *in utero*, the baby at birth might show the features of a true hermaphrodite. If symptoms developed after birth, the clitoris enlarged and other male features appeared. Later still, early puberty took place. After puberty, the patients presented the features of Harvey Cushing's syndrome.

Dr. Stokes said that the question of what was to be done arose. The investigations were incomplete, but he was anxious to show the child before any operative procedures were carried out. He wanted to learn whether there was an increase of androgens in the urine. Dr. Bettinger had carried out tests for excess urinary androgens, and these gave positive results. Dr. Stokes thought that some treatment would have to be given. No tumour was palpable in the adrenal area. A straight X-ray film might reveal calcification. Insufflation of air into the retroperitoneal space had not been carried out at the Children's Hospital, but had been performed at another hospital. Major Freidman, of the United States Army Medical Service, had been consulted, but he denied having had experience of the condition in so young a child. Pyelography might reveal distortion of the renal pelvis. In the majority of such cases there was an increase in the amount of male hormones or similarly acting substances called androgens in the urine. In the female type, there was an increase in the amount of œstrogens in the urine.

DR. ROBERT SOUTHBY asked whether any of the surgeons thought it drastic to explore the suprarenals in such cases.

DR. H. J. SINN said that Dr. Stokes was to be commended for showing the patient; such a condition had not been shown for many years. As one who dabbled in pathology, he wished to object to the term hypernephroma applied to the condition. That name was given to a renal tumour because its histological structure resembled the arrangement of cells in the adrenal cortex. Further studies had shown that it arose from the renal tubules, and Grawitz's name had been attached to it, though by some it was still called hypernephroma. The term hypernephroma was not used to cover suprarenal cortical tumours, which might be responsible for the syndrome under discussion. Such suprarenal tumours were strictly called sarcomata, since the suprarenal cortex was mesoblastic in origin. However, since the cells of the suprarenal cortex acquired epithelial character, tumours arising from them might be regarded as carcinomata. Hyperplasia of the suprarenal cortex without actual tumour growth apparently was responsible in some cases. In other instances the syndrome was met with in association with tumours of the anterior pituitary, ovary, thymus and pineal body, in the last-mentioned, probably because of its proximity to the hypothalamus and its pituitary connexions. Since the adrenal cortex was more frequently at fault, Dr. Sinn said that exploration of that region appeared a justifiable procedure.

DR. W. FORSTER said that they should be conservative about operations on the suprarenal, at any rate before it was certain that the child was not a male with hypospadias. In the present case a lined tube was present running down from the extremity of the "clitoris" to the base, as seen in some cases of hypospadias. The two *labia majora* might be split scrota. It would be a worthwhile procedure from the diagnostic viewpoint to insert a small instrument like a urethroscope, to see whether a cervix was present. If this could be demonstrated, further information could be obtained by the injection of air or opaque fluid followed by radiological examination.

DR. KATE CAMPBELL asked Dr. Forster whether so much pubic hair would be present in a case of hypospadias.

Dr. Forster admitted that this was anomalous.

DR. EDNA BAYLISS said that the history given of the delayed onset of the genital changes, as well as the development of pubic hair, militated against the diagnosis of hypospadias.

DR. MONA BLANCH remembered a case at another hospital. That child, at the age of five years, had pubic hair and increased genital development. The child had a tumour of the right suprarenal cortex, which was removed; but the patient died of an adrenal crisis thirty-six to forty-eight hours after the operation. Dr. Blanch said she had read of methods of circumventing the adrenal crisis, but she had forgotten them. She asked for enlightenment.

DR. H. D. STEPHENS recalled a case described by Ross, in which the female characteristics were pronounced, including pubic hair of female distribution. The condition was thought to be an adrenal tumour, and operation was undertaken, but the patient died. The autopsy revealed sclerosis of the adrenals; but in the pelvis two large ovaries were also present, both of which were sclerotic. Quite a number of such cases were encountered. It is impossible to generalize on a single feature. Rectal examination, to see whether a uterus could be felt, would be worth while in Dr. Stokes's case. The prostate could not be felt at the patient's age. Langdon Brown's patient was eighteen years of age. The patient had a scrotum on one side with a testicle in it. On the other side, the scrotum was atrophied and empty. The "clitoris" was hypertrophic. The other characteristics were essentially feminine, including a high-pitched voice and female fat distribution. Every month, abdominal pain occurred, with hæmorrhage through the urethra. At operation a uterus was found with one tube and one ovary corresponding to the atrophic side externally. The other secondary sexual characteristics were male. This was a case of true hermaphroditism. Pseudohermaphrodites were externally female or male in their development. In many cases it was impossible to tell to which sex they chiefly belonged until they reached puberty. With regard to those patients who were externally normal, but were hermaphrodites internally, there was, of course, no difficulty in classifying the sex. Dr. Stephens thought that the patient under discussion inclined towards the female side, but he was not certain. Further investigations were necessary. If it was impossible to feel a uterus *per rectum*, the abdomen might be opened, but exploration of the adrenals was fraught with considerable risk.

Dr. Stokes, in reply, said that he regretted having given Dr. Sinn the wrong impression. He did not belong to the old school of pathologists. These lesions had been termed "hypernephroma". Dr. Stokes said he was pleased that Dr. Blanch had mentioned the possibility of sudden death after operation in such cases. He was aware of its occurrence,

but apparently its frequency was much greater in older people. Dr. Stokes felt that there was little doubt that the patient was a female, but he did not want to dogmatize. He felt that the introduction of air into the retroperitoneal space was quite justified, and the risk was apparently slight.

Correspondence.

SUCCESSFUL IMPLANTATION OF A TOOTH.

Sir: Successful implantation of teeth is as old as dentistry. Opportunities for practical application, however, are not common, and the following account of a successful case may be of interest.

Eight months ago during an operation for tonsillectomy, a child of eleven years had the misfortune to lose the upper front incisor tooth which was removed by the Davis gag. On the advice of the dentist the tooth was replaced in the gum without difficulty, even though an interval of at least one hour had elapsed since the removal of the tooth. The dentist then made a wax impression, and twenty-four hours later had constructed a silver splint which fitted over both front incisors. Six weeks later the splint was removed and it was found that some fibrous union had occurred. Recently the mother informed me that after eight months the tooth was still firmly in position.

Dr. Roy Cash, the dentist to whom we owe the successful management of the case, expresses the opinion that the tooth may last for fifteen years. Although now a devitalized tooth, the advantage of retaining it in preference to wearing a plate at this age is sufficiently obvious. The removal of the nerve pulp will be considered at an early date.

Yours, etc.,

H. McLorinan.

Infectious Diseases Hospital,
Fairfield,
Victoria.

October 5, 1943.

THE MEETING OF THE FEDERAL COUNCIL.

Sir: I have read with great interest the report in the issue of October 2 of the Federal Council of the British Medical Association in Australia and was much impressed by the lack of factual basis for the conclusions and opinions expressed by the members of that body.

Nobody seemed to know whether a full-time secretariat was necessary because nobody seemed to know what functions were expected to be performed by such a secretariat. In the absence of such a defined policy, of course, it is improbable that a correct assessment of the staffing required would be possible.

Consequently nobody knew what expenditure was contemplated as a necessary basis for determining the amount of money to be provided on a *per capita* basis.

One gains the impression also that much of the argument about the formulation of schemes for improving medical services to the community would have a sounder basis if the factual data about the present services to the community were known. This shows up very evidently in the discussion on rehabilitation services where, without any evidence adduced as to the efficacy of the present system in treating fractures, a scheme purporting to improve this unknown state is referred to each branch with the recommendation that it should be sent to superintendents of hospitals. This is very reminiscent of the procedure whereby a distressing file is referred to the Governor of Shang-ri-la . . .

In the discussion on selection of students for medical courses in Australian universities there is again evidence in the initial discussion of gross lack of knowledge on the system of selection. The committee appointed certainly obtained a clearer view on this matter, but we are still left with the statement that in the University of Melbourne over the last three years 50% of the students entering clinical work had foreign names which to some members of the teaching staff were "unpronounceable". Here it is possible for me to give the figures in the last three years:

Total number of students passing third year medicine in the years 1941-1943 inclusive: 262.

Total number of unnaturalized students of European origin passing third year medicine in the years 1941-1943 inclusive: 6 (3 Poles, 1 Hungarian, 1 Austrian, 1 Italian [15 years in Australia]).

This short survey of the proceedings allows me to suggest a very useful function for a full-time secretary, namely, keeping of adequate statistics upon which future policy may be based. It is one of the boasts of the profession that they have the confidence of the public and of individual members of the public in individual members of the profession. The case for personal selection must be based on the behaviour of patients in this respect; until we know the proportion of people who change from doctor to doctor and the proportion who stay faithfully with one practitioner, no true assessment can be made. Apart from the possibility of dealing with these general characteristics of the relationship between the profession and the public we have also the problem of whether or not the present system of treatment is effective in individual instances. For example, in fractures, we do not know at present what is the average time for return to work of any fracture patient and we do not know whether under a given *régime* this period is significantly different from that of other *régimes*.

While formulæ are based on opinion, the loudest voice most persistently used or even a small voice holding authority will determine the future. Factual data can sometimes influence even strongly held opinions.

Yours, etc.,

R. Douglas Wright,
Professor of Physiology.

Department of Physiology,
University of Melbourne,

October 6, 1943.

VENEREAL DISEASES AND THEIR PREVENTION: SOME RECENT PRONOUNCEMENTS.

Sir: In your editorial, "Venereal Diseases and Their Prevention: Some Recent Pronouncements", you mention that the National Health and Medical Research Council thinks that statements on sex education should be confined to those issued by health departments or official medical bodies. This suggestion cannot be allowed to pass without comment.

Health departments and official bodies are always conservative where controversial issues, such as sex education and venereal disease, are concerned. They follow change in medical opinion; they do not lead it. An official in a health department, when he makes any public statement, says not what he would like to say, or at any rate not all that he would like to say, but only so much as will not get him into trouble with his seniors, or with those in authority over him. When officials are asked to join societies, groups, or deputations aiming at reforms, they often say quite frankly that they are personally in favour of the aim, but are prevented by their office from expressing their view publicly.

Official bodies are, quite understandably, at least equally conservative. Let me put a hypothetical case. Many authorities in the field of sex, who regard fornication as a sin and chastity as a virtue, nevertheless believe that moderate sexual activity is beneficial to the physical and psychological health of the normal adult, though they would not sanction it outside marriage. Many other authorities, who adopt the scientific, as opposed to the religious, attitude to life, agree that moderate sexual activity is beneficial to the health of the normal adult, and do not regard fornication as a sin, nor chastity as a virtue, though they are keenly aware of, and may be tireless in pointing out, the dangers of promiscuity, and the practical disadvantages, from both individual and social points of view, of irregular sexual relationships.

Now let us suppose that the British Medical Association should be asked to issue a statement on these matters, as is indeed suggested by the National Health and Medical Research Council. Is it imaginable that the British Medical Association would publicly support, or even give publicity without support to, the views of these two groups of authorities? If it were to do so, it would at once create violent dissension within its own ranks, for it would offend the sincerely held religious convictions of many of its members. One can picture the indignation of practising Roman Catholics or orthodox Anglicans. Indeed they might easily resign *en bloc* in protest. Quite obviously, the very nature of the British Medical Association, or any other such official body, would prevent it from committing itself in a controversial matter of this kind.

Non-conservative statements on such controversial topics can, therefore, be expected only from individual doctors, or non-official groups, who are not employed in health departments and who are free to express their personal opinions. Only when they have wrought a change in public opinion

will health departments and official bodies like the British Medical Association dare to follow the lead that has been given.

In your editorial, you recommend Weatherhead's book, "The Mastery of Sex", as "one that medical practitioners should have always at their elbow so that they can put it into the hands of parents and intelligent adolescents". There is much in the book that is admirable, but surely you have overlooked the many factual errors it contains.

For instance, on page six the author states: "The likelihood of fertilization . . . is said to reach the highest point six days after menstruation begins, remaining at that height till the twelfth day, and then declining to a point of sterility on the twenty-second day; but this is not an infallible rule." On page eighty-seven: "It may be found in many cases—though this is never certain—that halfway between a woman's periods there is a time when she is less likely to become pregnant." And on page 103: "that period of two or three days, a fortnight after the first onset of menstruation, which, though not 'safe' in any certain sense, is a time when conception is less likely to occur." The view here expressed is directly opposed to the weight of modern medical opinion, which regards the period, here recommended as comparatively safe from likelihood of fertilization, as the time when fertilization is most probable.

On page 23, the authors speaks of "the male fluid or semen, previously formed in the testicles". The semen is, of course, not formed in the testicles at all. Only one of its constituents is formed in the testicles, the others being formed in the prostate and other glands.

On page 24 he states that Ellis's contention that a syphilitic primary sore can be acquired by kissing "is only true if there is a chancre on the lips or possibly in the throat of the sufferer from venereal disease". This is false. Infection may be acquired from a person who has not a chancre, but secondary lesions, and not only on the lips or in the throat, but also on the tongue or gums.

On page 109 he states that: "Statistics show that the birth proportion of the sexes is one hundred boys to one hundred girls. Nature's purpose is therefore obvious. . . ." The statement happens to be quite wrong. The proportion of males to females at birth is between 104 and 107 to 100.

On page 229 he states that "the skin covering the scrotum and penis is sexually sensitive, the most sensitive part being the tip of the glans. These are the only erogenous zones in the normal male". The last sentence is erroneous.

On page 230 he states that "in the womb, the egg-cell is fertilized by a male sperm". He repeats this error on page 239. It is generally accepted that fertilization normally takes place in the Fallopian tube.

On page 231 he states that the "cervix is capable of opening more widely and of exerting spasmodic or sucking movements upon the glans of the male penis". There is not a shadow of evidence for this fantastic statement.

On page 235 he states: "Normally, round about 60, there is an enlargement of the prostate gland with a corresponding heightening of sexual desire with mental concomitants often distressing to men at this period." This generalization is false—it is true of only a minority of men.

On page 238 he says: "The sperms pass upwards . . . partly through the action of the cilia or hair-like projections from cells lining the genital passages which push the sperms towards the mouth of the womb." As the vagina is lined by squamous epithelium and has no such cilia, this statement appears to be completely erroneous.

The trouble appears to be that Weatherhead himself has no medical knowledge, and he was so anxious to make certain that his medical advisers were sound Christians, that he took no trouble to make certain that they were reliable scientists.

Yours, etc.,

NORMAN HAIRE.

193, Macquarie Street,
Sydney,
October 8, 1943.

THE PARLIAMENTARY JOINT COMMITTEE'S REPORT.

SIR: Dr. A. E. Brown, in his letter published in the issue of the journal of October 9, 1943, evades the issue. He does not say that it is impossible for a general practitioner to do the optimum amount of public health work, nor does he give any suggestion as to the implication of the wretched, uninformative word "minimal". Therefore I say he is unscientific, and that the report is unscientific, because of lack of thoroughness in its work.

Out of at least 1,000 general practitioners practising in Australia at present, 105 were interviewed. The interviews must obviously have been very short, as the committee's report shows that, *inter alia*, in 84 field days 186 miles a day were travelled, 370 hospitals were visited and 105 country doctors were interviewed, public health matters were discussed with State officials and pharmacists were interviewed. To give a considered report after such a rush and such rapid collecting of material is impossible.

As regards the interview with the 105 country doctors, we have a right to know just what form the questions assumed in the matter of public health. The average practitioner would not regard his regular, constant preventive medicine as public health work, but would, if asked about public health, immediately visualize communal measures such as nutrition, industrial hygiene, sanitation, disposal of sewage, water supply, drainage, segregation of the unfit. As regards the care of the tuberculous and of the aged and the insane, the blame for these grave blemishes must rest upon the political parties who have been in power, and upon the whole-time salaried public health officials who have advised them. The general practitioners have been clamouring for the admission of patients to suitable institutions; but not nearly enough have been provided.

Yours, etc.,

A. M. DAVIDSON.

Edgeware Road,
Enmore,
October 13, 1943.

The Royal Australasian College of Physicians.

MEETING AT SYDNEY.

A MEETING of the Royal Australasian College of Physicians was held at Sydney on Friday and Saturday, September 24 and 25, 1943. Meetings of the Council and of the Board of Censors were held and two scientific sessions were conducted.

At the Council meeting held on September 24 the office-bearers for the two years commencing April, 1944, were elected to take office at the next annual meeting. They are as follow:

President: Dr. Harold John Ritchie (N.S.W.).
Vice-Presidents: Brigadier Fred Thompson Bowerbank (N.Z.), Dr. Stewart Arthur Smith (N.S.W.), Dr. Alfred Edward Rowden White (Vic.).
Censor-in-Chief: Dr. Stewart Osburn Cowen (Vic.).
Hon. Secretary: Dr. Charles George McDonald (N.S.W.).
Hon. Treasurer: Dr. Arthur Hamilton Tebbutt (N.S.W.).

Examinations for membership of the college were conducted in Australia and New Zealand prior to the meeting and on the recommendation of the Boards of Censors the following were admitted by the President as members: Major G. R. Beattie (Tas.), Dr. P. Lesley Bidstrup (S.A.), Major Eric L. Davis (N.S.W.) and Dr. D. U. Strang (N.Z.).

The following contributions were given at the scientific sessions: Dr. Leslie Cowlishaw, "Vesalius the Anatomist" (illustrated by an exhibition of his works); Dr. Bruce Shallard, "Patent Ductus Arteriosus"; Dr. C. G. McDonald, "Hepatitis"; Major T. McP. Brown, 118th General Hospital, United States Army, "The Management of the Rheumatic Heart"; Dr. H. Maynard Rennie, "Bronchial Adenoma: A Clinical Study"; Surgeon-Lieutenant S. A. Sewell, R.A.N.R., "Neuroses in the Services". A clinico-pathological exhibition was arranged by Dr. S. A. Smith. Dr. A. J. Canny also demonstrated a pathological exhibit.

The sixth annual meeting of the College will be held at Sydney in April, 1944.

Naval, Military and Air Force.

APPOINTMENTS.

THE undermentioned appointments have been promulgated in the *Commonwealth of Australia Gazette*, Number 218, of October 7, 1943.

ROYAL AUSTRALIAN AIR FORCE.

Citizen Air Force: Medical Branch.

Wing Commander A. H. Baldwin (264907) is granted the acting rank of Group Captain whilst occupying a Group Captain post with effect from 1st September, 1943.

The following Flight Lieutenants are granted the acting rank of Squadron Leader whilst occupying Squadron Leader posts with effect from 1st August, 1943: A. G. R. Uglow (251196), G. Simpson (252083).

CASUALTIES.

According to the casualty list received on October 13, 1943, Captain G. D. Cumming, A.A.M.C., Manly, who was previously reported missing, is now reported to be a prisoner of war.

According to the casualty list received on October 13, 1943, Captain J. P. Higgin, A.A.M.C., Cronulla, who was previously reported missing, is now reported to be a prisoner of war.

According to the casualty list received on October 15, 1943, Major A. F. Hobbs, A.A.M.C., Fitzroy, South Australia, who was previously reported missing, is now reported to be a prisoner of war.

Nominations and Elections.

The undermentioned have been elected as members of the New South Wales Branch of the British Medical Association:

Bell, Malcolm, M.B., B.S., 1941 (Univ. Sydney), 35, Main Street, Lithgow.

Bretherton, Kenneth Wilbur, M.B., B.S., 1942 (Univ. Melbourne), TX6481, Captain K. W. Bretherton, 54th Aust. Comp. A.A. Regt., A.I.F., Australia.

Brown, David Arthur, M.B., B.S., 1941 (Univ. Sydney), 17, Arnold Street, Killara.

Epps, Reginald Glover, M.B., B.S., 1943 (Univ. Sydney), Sydney Hospital, Macquarie Street, Sydney.

Fraser, William Hector Munro, M.B., B.S., 1941 (Univ. Sydney), 71, Fitzroy Street, Burwood.

Goding, Geoffrey Arthur, M.B., B.S., 1940 (Univ. Melbourne), VX104320, Captain G. A. Goding, Regimental Medical Officer, 47th Australian Infantry Battalion, Australia.

Henry, Maurice Salmonow, M.B., B.S., 1943 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.

O'Hara, John Joseph, M.B., B.S., 1943 (Univ. Sydney), 16, Willee Street, Burwood.

Roxburgh, Russell, M.B., B.S., 1943 (Univ. Sydney), Royal North Shore Hospital, St. Leonards.

Sherin, Betty Mary, M.B., B.S., 1943 (Univ. Sydney), Balmain and District Hospital, Booth Street, Balmain.

Skinner, Walter James, M.B., B.S., 1940 (Univ. Sydney), 45, Ramsgate Avenue, North Bondi.

Swain, Ian Harold Fulcher, M.B., B.S., 1943 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.

Symonds, Bruce Braham, M.B., B.S., 1943 (Univ. Sydney), Royal North Shore Hospital, St. Leonards.

Tom, Joan Pearson, M.B., B.S., 1940 (Univ. Sydney), Royal Alexandra Hospital for Children, Camperdown.

Gillespie, Robert Eddington Rome, M.B., B.S., 1941 (Univ. Sydney), NX105458, Captain R. E. R. Gillespie, A.A.M.C., 121st Australian General Hospital, Australia.

Obituary.

JOHN STUART MacFARLANE.

We regret to announce the death of Dr. John Stuart MacFarlane, which occurred on October 18, 1943, at Ryde, New South Wales.

Books Received.

"Eleven Weeks in a Japanese Police Cell", by Chas. I. McLaren, M.D.; Second Edition, Revised; 1943. Melbourne: S. John Bacon (Marshall, Morgan and Scott Limited). 7¼" × 4¾", pp. 44. Price: 1s. 6d.

"Psychological Medicine: A Short Introduction to Psychiatry, with an Appendix, War-Time Psychiatry", by Desmond Curran, M.B., F.R.C.P., D.P.M., and Eric Guttmann, M.D., L.R.C.P. (Edinburgh), with a Foreword by J. J. Conybeare, D.M., F.R.C.P.; 1943. Edinburgh: E. and S. Livingstone. 8¾" × 5¼", pp. 196, with 21 illustrations. Price: 10s. 6d. net, postage 6d.

Diary for the Month.

Oct. 26.—New South Wales Branch, B.M.A.: Medical Politics Committee.
Oct. 27.—Victorian Branch, B.M.A.: Council.
Oct. 28.—New South Wales Branch, B.M.A.: Branch.
Nov. 2.—New South Wales Branch, B.M.A.: Organization and Science Committee.
Nov. 3.—Victorian Branch, B.M.A.: Branch.
Nov. 3.—Western Australian Branch, B.M.A.: Council.
Nov. 4.—South Australian Branch, B.M.A.: Council.
Nov. 5.—Queensland Branch, B.M.A.: Branch.
Nov. 9.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
Nov. 9.—Tasmanian Branch, B.M.A.: Branch.
Nov. 12.—Queensland Branch, B.M.A.: Council.
Nov. 16.—New South Wales Branch, B.M.A.: Ethics Committee.
Nov. 17.—Western Australian Branch, B.M.A.: Branch.
Nov. 18.—New South Wales Branch, B.M.A.: Clinical Meeting.
Nov. 23.—New South Wales Branch, B.M.A.: Medical Politics Committee.
Nov. 24.—Victorian Branch, B.M.A.: Council.
Nov. 25.—New South Wales Branch, B.M.A.: Branch.
Nov. 26.—Queensland Branch, B.M.A.: Council.

Medical Appointments: Important Notice.

Medical practitioners are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phœnix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia.

Editorial Notices.

Manuscripts forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to The Medical Journal of Australia alone, unless the contrary be stated.

All communications should be addressed to the Editor, The Medical Journal of Australia, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

Members and subscribers are requested to notify the Manager, The Medical Journal of Australia, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility unless such a notification is received within one month.

Subscription Rates.—Medical students and others not receiving The Medical Journal of Australia in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rates are £2 for Australia and £2 5s. abroad *per annum* payable in advance.

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Public Service Commissioner.

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C. D. McINTYRE,
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*Meyer, E., and Arnold, L., *Amer. J. Digest. Dis.*, 5:418

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